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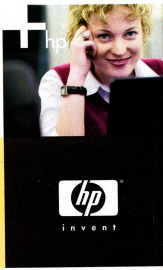

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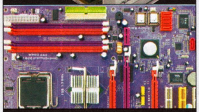
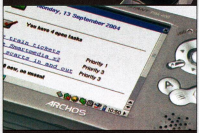
IN THE LABS

PCs and notebooks



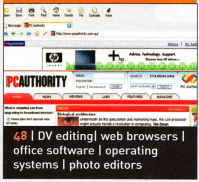
39 | Dual-core CPUs| graphics cards | small form factor PCs | next gen motherboards

Peripherals



44 | Home and data projectors | portable media players | and more...

Software



48 | DV editing| web browsers | office software | operating systems | photo editors

138

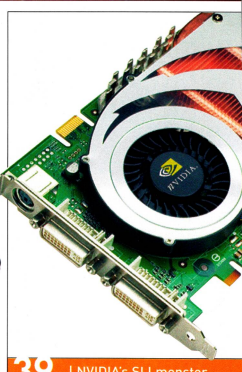
There's heaps of great gear on our CD. Head here for a full listing.

106

Subscribe, save, and go in the draw to win great prizes.

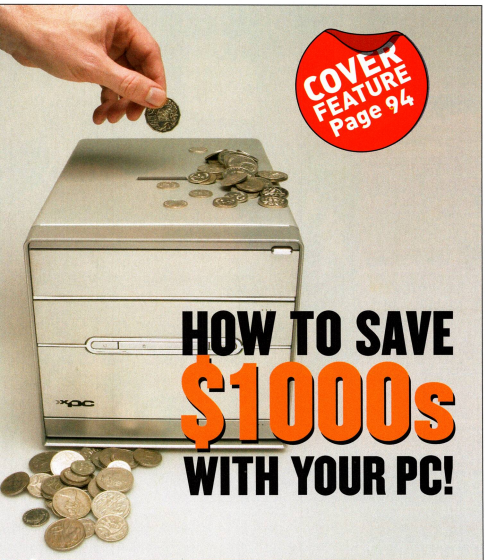
58 | Mobile theatres compared.

78 | Portable music on test.



39 | NVIDIA's SLI monster.

AUSTRALIAN PCAUTHORITY THIS MONTH



94 | How to get the best savings with a PC and a net connection.

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Can your ISP speed up your connection? 103

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MULTIMEDIA NOTEBOOKS
They're big, they're packed with features, and they entertain you. 58

WIRED FOR SOUND
The iPod isn't the only portable music player out there. We test 15 of the latest pocket players. 78

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OBSERVATION: Time lost in traffic jams is time lost forever. More than downtime, it's *down* time: frustration instead of stimulation, indignity instead of inspiration. Counterproductive emotions when progressive employers seek to cultivate mutually rewarding productivity.

REALISATION: True performers want to perform, and can always be trusted to.

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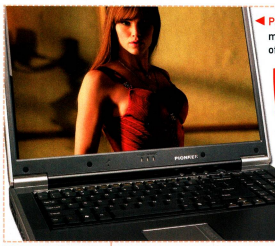
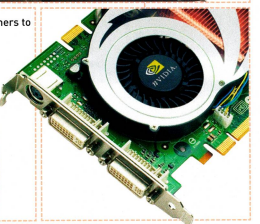
THIS MONTH'S TOP GEAR



◀ Page 60 Pioneer's monster multimedia notebook is the best of the lot.

NO ONE TESTS TECH LIKE PC AUTHORITY

▼ Page 84 The Carbon beats all comers to the portable music party.



▲ Page 39 NVIDIA's 7800 GTX is put through its paces.

◀ Page 48 Will the next version of the Office-killer keep its crown?

LOGIN

It wasn't so long ago that owning a PC was seen as a financial burden rather than benefit. In fact, its real value was largely gauged in the business environment, where it could measurably increase the productivity of workers. Home use, on the other hand, was seen as an indulgence.

While we admit that the 15 grand splash tag on the cover only applies for those currently in real estate, the general savings you can encounter through savvy use of your PC and the internet more than pays for the cost of your PC. We think this is still a hot topic and I'd invite you all to email through any other areas where you've noticed considerable savings on the internet or by just simply using a PC.

On the product front, the Labs team has gone entertainment crazy. We put out the call to multimedia notebook and MP3 suppliers and rounded them all up on how capable they are at entertaining us.

'On the product front, we've gone entertainment crazy. '

On the serious side, we've also taken a look at some truly serious hardware in the form of NVIDIA's new 7-series SLI monster, AMD's dual-core, and ECS' multi chipset motherboard.

The sheer amount of new tech and product reviews that continues to pass through the Labs is testament to the dedicated work of Darren Ellis. Unfortunately, this is Darren's last issue with *PC Authority* before he heads abroad to Singapore and we all wish him the best of luck. Taking over where Darren left off is Nick Ross, who has graced our Labs sections many times in the past and headed up numerous hard-hitting roundups and features.

We have big plans for the Labs section in coming months, so stay tuned.

David Kidd, Editor
dkidd@pcauthority.com.au

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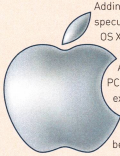
Techdesk

Latest news, trends and products in the world of technology

APPLE SALES SLUMP AHEAD



Adding weight to speculation of Mac OS X being widely available on AMD or Intel PCs is the expected sales slump Apple will now face before switching over to the new Intel production line.

Prospective buyers are less likely to shell out for Apple gear when an entirely new system will be available within 18 months. With market share already reported as low as 2.3 percent, Apple may face lean times ahead. One way to recoup cash flow would be to unleash Mac OS X on the whole PC community. Coincidentally, it would likely happen at the same time MS releases Longhorn – for the ultimate OS showdown..

FROM WINTEL TO MACTEL

Apple's shock announcement to switch from IBM's PowerPC chips to Intel could have far more implications than seriously upsetting IBM. PC users could be the big winners, who will undoubtedly benefit from the increased competition – at Microsoft's expense.

What it means in real terms is that the next version of Mac OS X, code-named Leopard, could well run on your standard PC at home.

The finer details have yet to be announced but so far the signs are good that PC users could ditch Windows forever and at last be able to get their hands on Apple's much lauded Mac operating system without emulation.

Apple's 10 year partnership with IBM – and repeated crowing over its supposed technological advantages over Intel – finally came to an end when IBM simply couldn't get their new G5 processor running fast enough in desktops but still be cool enough in laptops. Overtures from Intel finally persuaded Apple that the companies mass market chips had advantages IBM couldn't now promise.

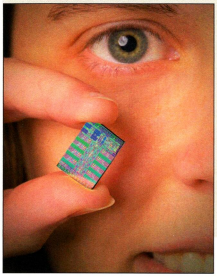
At Apple's chip switch announcement, Steve Jobs demonstrated Intel chips can already run the current Mac OS X without a loss of speed. Additionally, Apple's new developer kits are based around a current Pentium 3.6GHz chip. It's almost certain Apple's new software will be PC-friendly. Apple's Rosetta emulator was revealed to be capable of running Mac OS X programs at full speed on a Pentium chip. In fact, Jobs revealed Mac OS X has secretly been able to run on Intel chips for the last five years.

Apple will still remain a major manufacturer, turning out laptops and desktops using Intel chips from late 2006.

Apple has said at this stage that OS X will be locked to Apple hardware only – but hackers will undoubtedly find a way around that. If the new OS X is PC-compatible, it may mean Apple becomes just another PC brand like Dell. But if the switch to Intel opens up OS X to millions of current Wintel computers, Apple would overnight turn into a major player in the OS software market.

If it doesn't happen, it could be one of the greatest missed marketing opportunities in history.

IBM'S HARD CELL CONTINUES



Despite losing Apple as an exclusive client for the desktop, the future is still bright for IBM. It's at the forefront of PowerPC cell processor technology and those chips will be an essential part of the next generation of games consoles. Sony has confirmed it's using the Cell chip (left) in its PS3 and MS will also be using IBM chips in its XBox 360. Microsoft's move away from Intel for its new console was seen as a surprise, but there does seem to be a bit of rift opening in the once-cosy Wintel MS-Intel alliance. Last month, an MS exec went on the record praising Intel rivals AMD for pioneering consumer 64-bit processing. Could this be payback for Intel teaming up with Apple? After all, MS looks to have the most to lose from the new partnership.

'Intel has the strongest processor roadmap by far'

Apple's Steve Jobs has changed his iTune.

WHAT TO DO WITH A MACPC

Dual boot: Making Win XP dual bootable with another OS must have seemed a great idea when there was no other competition apart from Linux, but the choice of Win XP for games and Mac OS X for everything else suddenly seems very appealing. Until, of course, developers give up on Windows altogether.

Emulate: OS X Leopard running Rosetta running Mac Classic running Virtual PC running Win XP running Pear PC running iTunes until it SMOKES!

OS X vs WIN XP DEATHMATCH!

Head to head – which is the best?

SECURITY

Windows is notoriously suspectible to hackers, viruses, spyware and just about anything else. MS patches plug the gaps but it would obviously be better if they didn't have to. **Macs** are notoriously free from any viruses and most other attempts to exploit them fail too. However, one opinion is that the relative virus-free platform has more to do with there being so few Macs in the world, and consequently not worth the effort.

WINNER: OS X

FEATURES

For all its faults, **Windows** comes packed with features – so much so that governments are demanding MS remove some to give others a chance to compete. Its software and hardware wizards make easy work of installations. But **Macs** aren't short of built-in software, especially multimedia apps. Macs are also famously easy to use for beginners, but when you get into the complexities of certain set-ups, Macs can often be trickier to run than a Windows machine...despite what Mac owners insist.

WINNER: Windows – just.

COMPATIBILITY

This is where **Windows** comes into its own. Some of its failings are because of its wide compatability with a huge range of hardware and software from countless manufacturers and developers. **Apple** as a hardware and software supplier is able to keep far tighter controls over what its OS works with. As a result, this could be the one point that keeps OS X from installing on any old Intel PC – drivers will have to be written especially for OS X. But you can bet someone somewhere on the internet will have hacked the driver you need.

WINNER: Windows

FUTUREPROOFING

Apple's OS X is already at the stage where **Windows** hopes its next-gen Longhorn will be in 2006/7. By the time Leopard comes out, you can bet Apple will have come up with a few new tricks to overshadow anything MS can offer.

WINNER: OS X

...And the king of the ring is: A draw on points.

The rematch is planned for January 2007

Pot kettle black

■ In a wonderfully ironic twist to the Internet Explorer and Netscape wars, Microsoft claims Netscape's new 8.0 browser breaks IE's XML rendering capabilities. The suggested fix is of course to remove Netscape.

Fast boot card

■ If you get bored easily and Win XP takes too long to load, Gigabyte's new card will speed things up. Its PCI add-in card boasts 512MB (expandable up to 4GB) of DRAM powered by a battery. Essentially, the card will take a snapshot of your PC as you power down, allowing it to quickly wake itself up at boot time. Additionally, the built-in battery will protect the stored content in the memory. Expect it in the second half of this year.

Atomic PCs

■ The long awaited molecular processor is finally a reality. So far though it is only a single molecule acting as a single transistor. Canada's National Institute of Nanotechnology claims it needs a million times less power than a conventional transistor. A CPU version is still a long, long way away though.

X-Fi is new hi-fi

■ Just when you thought PC sound had come as far as it could with digital signals and 7.1 gold-plated outputs, Creative manage to push the envelope that little bit further. Its new soundcard boasts true 96kHz-24 bit signals, 11 times more transistors, 24 times the processing power and double the clock speed which now rivals graphics cards, running at a cool 400MHz.

'Microsoft congratulates AMD on its leadership'

Is Microsoft's Brian Valentine seeking new mates after Intel swapped allegiances for Apple?

iPod settlement

■ Apple has settled the class action over claims the company misled iPod buyers over the life of its batteries and their running time between charges. Affected customers can claim a $50 voucher from Apple – but the settlement only applies to Americans, not Australians.

Nintendon't bother

■ Nintendo are firmly in third place in the console wars but its latest decision to delay the launch of the new Revolution games machine could help. The company isn't planning to unleash it until 2007, 18 months after XBox 360 and about a year after the PS3. It could give them an edge in the tech stakes though which may attract sales.

Console plans

■ Meanwhile, both Sony and MS have unveiled their next gen machines, just as Sony sells its 90 millionth PS2. The new XBox is likely to sell for US$300 on its launch (an estimated loss of US$75 on the cost of its components). That will probably translate to about $499 when it finally reaches Down Under.

IE gets tabs at last

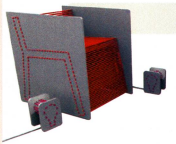
■ Who said Microsoft isn't innovative? Just a matter of years after its rivals started offering tabbed internet browsing, Microsoft has finally joined the fray. The new version of MSN Search Toolbar also boasts the ability to have basic tabs of IE windows. The release comes on the eve of the first IE7.0 beta which is expected to have tabs as standard.

most wanted

PMP MY VIDEOS

There's been a glut of Personal Media Players released in the last few weeks which all do pretty much the same thing – provide a 40-80GB HD and the ability to play a variety of video and music formats. PQI's tiny and shiny mPack P800 is one that appeals.

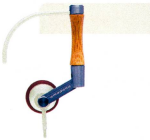
www.pqi.com.tw



STITCHED UP SOFAS

This is brilliant. It's an MFD frame that lets you sew your own furniture. Yes, you read that right. If you fancy a crochetted couch or a woollen lounge, this is what you've been waiting for. You can even make your own sew-it-yourself sidelight and standard lamps. A definite conversation piece.

http://mocoloco.com



BAMBOOM-BOOM-BOOM

These are just so classy we had to pinch ourselves to make sure it was something we really did want. But yes, who could resist these bamboo-featured earphones? Sadly their website is too foreign for our Western eyes.

www.amadana.com

BIG BLACK BOX

It's a bloody big black box with bright blue LED writing on the front – who could resist? But more than that it's a Blu-ray disk cinema quality AV decoder/amp/receiver thingy. It's bound to sound beaut and with a box like that, who's going to argue?

www.blu-lasercinema.com

SHINY BAR OF JOY

There's nothing we like better at the end of a hard day's coding or online sniping than to relax with a cocktail. Actually that's a total lie (on all counts), but if we had a cocktail bar like this, we might consider spending some quality time with a martini.

www.trendir.com

HOT...

VOIP

Putting broadband over telephone lines so we can make cheap telephone calls over the internet. There's something intrinsically wrong about that and yet still so, so right.

YOUSENDIT.COM

Need to send a file that's too big for email? Just head to yousendit.com. Upload the file to the server and it will send a secure log in by email to the recipient who can then download it at their convenience. And it's free.

WIRELESS

It doesn't matter what it is – networking, keyboards, mice, speakers – making it wireless just makes it better... so long as it doesn't involve Bluetooth.

AZUREUS

It's not just us that think this is a stellar, cross platform, feature-packed BitTorrent client. At the time of writing, this is the most popular app on Sourceforge.net, one of the biggest open source software repositories out there.

LINUX

All those Bittorrent distros have led us to one conclusion: Linux sucks. It's making strides in usability, but it still has a long way to go to compete with the masses.

MOBILE TELCOs

They're so strict. They don't seem to understand we need that new black Motorola RAZR V3, and we can't just wait another four months until the contract can be renewed.

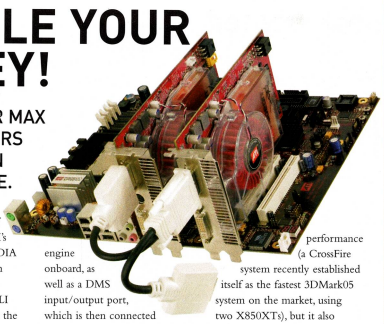
...NOT

'Revolution will create entirely new genres of video games'

Nintendo President Iwata Satoru will be hoping it's not the 'unplayed' genre like the Dreamcast's games.

DOUBLE YOUR MONEY!

MAX BANG FOR MAX BUCKS – GAMERS GET CAUGHT IN THE CROSSFIRE.



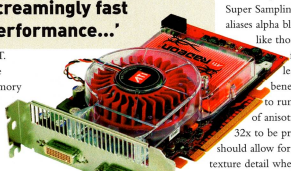
In the tit for tat world of graphics technology, ATI's latest answer to an NVIDIA innovation has recently been launched in the form of CrossFire. Like NVIDIA's SLI technology, CrossFire allows the use of two video cards in one system to deliver blistering performance, at a similarly blistering price, but it appears to be a more open system.

Unlike SLI, which demands the use of two identical video card chipsets (such as two 6800GTs or two 6800 Ultras), CrossFire has the benefit of being able to work with dissimilar video cards. This means it's possible to pair up an X800XT with an X850XT. However, both cards need the same amount of onboard memory – if one card with 128MB is used with 256MB card, the larger video card will only make use of 128MB of its onboard memory. The same holds true for the number of pixel pipelines in the video card – if a 12 pipeline card is combined with a 16 pipeline card, the faster card will only use 12 of its pipelines.

The biggest caveat of CrossFire is that one of the cards in the twin card setup must be a special CrossFire edition. This has its own dedicated compositing engine onboard, as well as a DMS input/output port, which is then connected to the secondary card's DVI video port via a dongle.

CrossFire uses a different system of splitting the load than SLI (which used either alternating frames, or broke each frame up into two sections). While it's capable of using the SLI modes, the main method is known as Supertile, where each frame is broken up into a number of 32 x 32 pixel tiles, much like a checkerboard. ATI claims this allows for a more even distribution of the load between the two cards.

'...CrossFire delivers screamingly fast performance...'



Not only does CrossFire deliver screamingly fast performance (a CrossFire system recently established itself as the fastest 3DMark05 system on the market, using two X850XTs), but it also enables two new forms of eye candy to make the most of the supreme performance where games might otherwise be choking at the CPU.

The first of these is Super Anti-Aliasing, which has two major benefits. The first of these is extremely high levels of anti-aliasing, up to 14xAA. It is also now possible to allow Super Sampling which anti-aliases alpha blended textures like those shimmering fences and trees leaves. The other benefit is the ability to run at high levels of anisotropic filtering – 32x to be precise. This should allow for unprecedented texture detail when viewing objects over a large distance.

If you've got a wallet that weighs more than a guest on the Jerry Springer show, look forward to the end of July this year, when CrossFire is due to hit retail. It's worth remembering that the next generation of cards aren't too far off though, which promise to offer CrossFire performance for the price of a single video card.

'Almost a million people are CrossFire-ready'

So says ATI, but are those million people's bank balance's ready for the cost involved?

Fastest printer yet?

■ Brother has unveiled its latest inkjet printer which can reportedly churn out a staggering 170 hi-res colour pages per minute. It uses a one page-wide piezo cartridge which sprays the moving paper rather than moving itself. For bigger page sizes, Brother simply adds more cartridge heads.

Virtual murder

■ A Shanghai online gamer has been given a suspended death sentence for killing a fellow gamer. Qui Chengwei stabbed Zhu Caoyuan in the chest when he found out he had sold his virtual sword for 7200 Yuan ($1000). Qui had lent the sword to Zhu to use in online game Legend of Mir 3.

Learn to rock

■ Unemployed teenagers in Britain are being enticed to attend summer school with the carrot of an iPod if they complete the course on how to find a job. Critics have branded it bribery.

Hacker extradited

■ A Pom who hacked into the US Defence Department's computers has been extradited to America to face charges. Gary Mackinnon, 39 – known as Solo in the net – found his way into Pentagon, NASA, Navy, airforce and Army computers.

Disposable video

■ A use-once video camera has been launched in the US. It offers full record and playback, with processing onto DVD for $15 and just $40 for the camera.

Excel's $11m bill

■ MS has been fined $11 million for patent breaches in Excel. A Guatemalan inventor had sued for $750 million but the court threw out nine of his ten claims.

Two byte hack

■ Just two bytes separates Win XP Home and Pro editions. A fairly simple change to the setup files before installation gives Home users access to the Pro features like remote desktop. MS is expected to change the insecure files shortly.

VOIP secure?

■ At the recent AusCERT 2005 Asia Pacific Security Conference on the Gold Coast, attendees were warned of the dangers of VOIP insecurity. Robert Graham of Internet Security Systems said: 'You must either ignore VoIP as a low-cost alternative or ignore system security.'

Cyber crime down

■ AusCERT (Australian Computer Emergency Response Team) says it dealt with about 700 incidents of online identity theft targeting the customers of ISPs and financial and e-commerce institutions in the 12 months to April. That's a 1200 percent increase on the previous year. Overall cybercrime was down in 2004 – thanks to firms stepping up security – but they found identity theft was on the increase.

ACSVIEW

LISTEN TO CODEMONKEYS.

Everyone has an opinion so who do you listen to? Edward Mandla heeds the words of the developer.

It's the common experience of most software developers and IT professionals that when people learn you work with technology, they start to ask a lot of questions. These could typically range from, 'I'm looking to buy a new computer – what would be a good one?' to 'What is the best way to protect my computer from viruses?'

Today, the advice of developers is highly regarded and most are very happy to give their advice.

A prime example of how developers' opinions can impact the popularity of products we use has been the rise of Google.

Back in 2000, most people had never heard of Google and one of the biggest questions being asked was, 'How do you get relevant search results from the Web?'

It seemed at the time that, no matter what search engine you used, they all seemed to point to a site where you were asked to buy something. Many developers were advising those who asked to use Google.

Google used a new and unique approach to searching by analysing the back links to websites. This allowed them to rank pages. Their rationale was that the more links a web page had, the more popular it must be and the more likelihood that this page would deliver relevant information to the person making the request.

The rise of Google has been phenomenal. It is now clearly the dominant search engine and the search engine of choice.

This achievement is even more remarkable when you consider it has been achieved purely by word of mouth, with the developer community leading the way. Now, Yahoo and Microsoft are rising to the Google challenge.

The current questions being asked of developers relate primarily to internet security. People want to know how to deal with pop-up ads and websites that install unwanted stuff on your hard drive such as spyware.

The advice many developers give is to suggest using Firefox. The Firefox web browser has passed the 50 million download mark, and has become the browser of choice amongst many developers. Firefox certainly has the potential to emulate Google's rise by becoming the dominant web browser. But to do so, it will have to overcome Microsoft, which is busily working on Internet Explorer version 7 and will do everything possible to head off this new juggernaut.

Firefox evolved from the Mozilla web browser and is an open source project that has attracted a dedicated and extremely savvy bunch of developers to work on it.

Whenever there is a problem, such as when someone finds a way to maliciously exploit Firefox, the team is quick to respond to plug the hole. Indeed, because it is open source, there are hundreds of programmers pouring over the code constantly to find potential holes before they can become a problem.

As in the case of Google, the developer community is advising those who ask to use FireFox. Many are recommending it to colleagues and friends, or even simply installing it on the computers of their relatives and friends and telling them this is how they should connect to the internet.

One thing I know about developers is that they like to talk about technology, and the people to whom they talk often take their advice almost without question. There is certainly a lesson here for companies: Don't under estimate the power of the developer community and its opinions.

Edward Mandla is national president of the Australian Computer Society. See www.acs.org.au for more info.

'The advice most developers give is to suggest using Firefox...the browser of choice among many developers'

With 50 million downloads under its belt already, it must be doing something right.

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TECHNOLOG

CLIPPY: A STORY

Is it time for Clippy to make a comeback?

Tim Dean thinks so, but only if it's not actually Clippy.

Anthropomorphisation. It's one of those big words that means a fairly straight forward thing – projecting human characteristics on something that's not human.

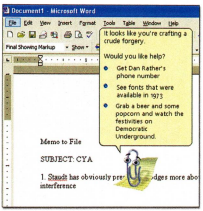
It's natural that we might take advantage of this impulse to make some inanimate objects more accessible to human beings, and a computer seems to be the perfect candidate.

This thought occurred to Microsoft back in the '90s, and it gave the Office developers an idea. The problem was that each new version of Office was riddled with new features that no-one used. New users were also overwhelmed by the fairly inherently counterintuitive interface that is a PC, and were especially bamboozled by tasks such as moving tabs around to insert the address at the top of a letter.

Enter the Agent. The idea was to have a software component, which was shareable across applications, that would help users do what they want to do, even if they didn't know how. The Agent would also be made anthropomorphic, so it would look non-threatening and non-technical. It would accept questions typed in plain English and dredge up the relevant answer from the Help files. Finally, and most cunningly, it would monitor a user's behaviour and suggest shortcuts and new features that would help them do things faster and more effectively.

It all looks good so far, on paper. However, the unfortunate product of this reasoning was Clippy, the Office Assistant paperclip.

For some (myself included) Clippy is up there in the annals of human tyranny, along with Caligula, Vlad the Impaler and Stalin. So how did such a common sense idea turn into such a universally loathed feature?



For the people who did hate Clippy, the reasons were usually based around only a few different points. The first was functionality – if you already knew how to use Office, you didn't need some know-it-all paperclip telling you there's a better way of doing things.

The second is that if you did want to turn Clippy off, you couldn't – he would reappear out of thin air when you least expected it. Interestingly, this turned out to be due to a bug, and was fixed, but too late for most people.

Finally, Clippy had an unfortunately condescending tone, especially if he had just intruded and told you for the 50th time how to write a letter.

Another interesting point about Clippy is most people who were borderline in their appreciation of the wee agent turned out to actually love the alternatives, such as Rocky the dog, Genius or Links the cat. However, Clippy was the default, even if he was the least appealing of them all. This ultimately came down to an unfortunate programming decision on behalf of the Office developers. Clippy had a smaller memory footprint than the bitmap agents, so they erred on the side of performance and left us with a duff agent.

At the end of the day, Clippy was an interesting experiment in user interface design, and was not without its lessons. While Clippy and his friends may be buried in the Office installation these days, and for good reason, I don't think their time is up. In fact, I have a feeling that the concept of a helpful and anthropomorphic agent will enjoy a resurgence in popularity in coming years, and I wouldn't be surprised to see one incorporated in Longhorn.

'In the next decade television will change in a radical way we are only just starting to comprehend.'

But you can bet John Woods will still be in Blue Heelers - and still won't have won a Gold Logie.

.xxx domain fury

■ ICANN has approved the release of the new .xxx domain for porn sites – but has already faced a backlash over worries non-porn adult sites will be forced to use the domain.

Sex degrees of...

■ First it was six degrees of separation through Friendster, now it's sex degrees of separation. Shagster.net hopes to connect all your ex-lovers up so you can see how close Sharon Stone is on your personal, ahem, love tree.

Osama Bin Trojan

■ The latest email trojan doing the rounds claims to be pictures of the capture of Osama Bin Laden. Sadly for the Whitehouse, it's a fake of course and instead infects PCs with Small.AXR trojan.

'May' means 'will'

■ Telstra has updated its Bigpond Unlimited Cable plan since introducing unavoidable hard speed capping once users hit 10G usage each month. Previously, the telco giant said it 'may' shape net speeds down to 64Kb/s once usage reached 10GB. Capping was arbitrary for the first year but was enforced rigidly earlier this year. After an outcry from users, the latest ads now state it 'will' shape at 10Gb.

Get in touch

■ Send details of news, new products or technologies to *techdesk@pcauthority.com.au*

COMPUTEX 2005

Ashton Mills reports from Computex on what new tech to expect this year.

Held around Taipei 101, the world's tallest building, this year's Computex was another gathering of gargantuan proportions. Over 1000 exhibitors came to demonstrate the latest and greatest in tech across four halls and 58,000 square feet. And here's what we found.

AMD used the show to officially launch its Athlon 64 X2 dual-core range of processors – the CPUs that will, along with Intel's Pentium D range, usher in a new age of dual-core desktop systems by the end of the year.

Similarly, NVIDIA used the show to announce the G70 GTX – a next generation GPU that is more than just a speed bump above its flagship 6800 Ultra line. The G70 is a new architecture that promises not only faster frames per second, but unprecendented levels of image quality through use of new technologies such as High Dynamic Range lighting and Multisampling for improved realism in games.

▲ Asia's biggest tech show is conveniently held near its tallest building.

▲ New case designs, like this from Lian Li, littered the showroom.

Not to be left out ATI announced its new dual-GPU gaming platform, CrossFire. Built to go up against NVIDIA's dual-card supporting SLI, Crossfire allows gamers to use two ATI based video cards in tandem to almost double frame rates in games. Unlike NVIDIA's solution, ATI claims Crossfire will work with all games and not just those for which a profile is specifically written. However, special 'CrossFire' enabled ATI based cards are required.

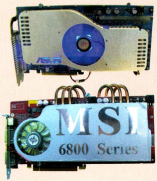
But the big guns weren't the only ones showing off new releases. ASUS demonstrated its new range of 4ms LCD monitors and mobile phones, while BenQ and MSI showed their latest portable multimedia players. Shuttle, the company that made small form factor PCs famous, presented their new range of XPC systems which were not only 64-bit and dual-core variants, but also a pre-configured dual video card SLI box complete with heatpipe cooling on the video cards!

Weird and wonderful cases made a showing in number as well, with Lian-Li's controversial seashell design, AOpen's sleek small form factor collection, and FIC's 'Piston' cylindrical case being some of the more interesting designs.

Overall Computex 2005 was, as always, a fantastic insight into the world of technology and what it holds in-store for us. If it was fast, innovative, cool (sometimes literally), or filled with blinking lights it was at Computex this year. And that means, in turn, that we'll see these new products hit the market very soon.

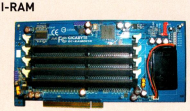
TOP PICKS OF THE SHOW

DUAL-GPU VIDEO CARDS



Both ASUS and MSI know that two is better than one – especially if you can fit them both on a single card. Two GeForce 6800 Ultras running in tandem equals extremely fast FPS in games.

I-RAM



Simple in design, innovative in concept, Gigabyte's i-RAM is set to bring cheap RAM drives to the masses.

AOPEN MINI PC

Apple's iMac mini has started a craze, a craze companies like AOpen are interested in.

VIA NANO-ITX

VIA, masters of the minute, have shrunken their boards further with the Nano-ITX range at just 12 x 12cm in size.

BOOTH BABES

Never on short supply, these sirens of the silicon realm grabbed attention at every booth, corner, and event. No show would be complete without them!

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- 100/10M Lan, 56K Modem, 1394 Firewire
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ACRONYMS AND APPLES

Things are a-changin' in the world of technology. Tim Dean takes a look at a few recent shifts.

The acronym BIOS (Basic Input Output System) has been with us for just as long as that other ubiquitous acronym, PC. In fact, the BIOS dates back to when the PC actually represented a specific brand – back before IBM clones entered the market. That was in 1982, where the 8-bit Intel 8088 reigned supreme, steaming along at a spritely 4.77MHz.

'That was in 1982, where the 8-bit Intel 8088 reigned supreme, steaming along at a spritely 4.77MHz.'

And here we are, in 2005, with dual-core, 64-bit processors running up to 3.73GHz (that's around 782 times the frequency of the 8088). In this world, the old BIOS is like an albatross around the neck of the modern PC. Given its legacy, the BIOS is limited to accessing no more than 640KB of memory, it is programmed directly in assembly language, it needs to be tied closely to specific hardware, and there's still no fixed specification for the operation of a BIOS, so incompatibilities still do occur.

The OS can also only communicate with hardware through the BIOS, which ties the OS to a particular platform. Furthermore, the BIOS uses processor-specific calls, which means all future processors from the 8088 onwards had to maintain some legacy silicon in order to let the BIOS work.

The final nail in the coffin is the desire for faster boot times, which isn't just a luxury feature – it's absolutely essential if PC hardware is ever to make inroads into the living room, where a POST (Power On Self Test) screen is both obtuse and unwanted.

Thankfully, there have been teams of code monkeys working on a replacement for the BIOS for a number years now. Unsurprisingly, it's another acronym, EFI (Extensible Firmware Interface), and it's best understood as an abstraction layer between hardware and software, similar in principle to an API like DirectX.

Unlike the BIOS, EFI is totally OS and platform independent, so as long as the hardware has EFI-compatible firmware, and the OS is EFI aware, then the two will get along. This means the OS no longer needs to make BIOS calls directly to the hardware in order to boot. Instead, EFI presents a unified picture to the OS, allowing it to boot without knowing the exact details of the hardware. Of course, the OS still needs device drivers, but it won't need to waffle around detecting hardware interrupts, DMA and that kind of thing – all of which slows down the boot process.

EFI can also use as much memory as is present in the system, and is written in C instead of in assembly language, so it's much easier on developers, and allows a far greater range of interfaces and features to be implemented in the pre-boot environment. This means vendors can start adding real features to their systems, such as security and manageability before the OS even loads. The use of C also doesn't tie it in to the old processor architecture, so theoretically the legacy real-mode support can be dropped from future CPUs, although in reality it could

INTEL INSIDE

What Jobs didn't say when he announced the Apple and Intel partnership was exactly what chip it would be, so we can't immediately expect it to be a Pentium D, although it's likely to be based on that platform. Jobs also didn't say anything about exclusivity, so there's always an option that AMD could also get involved in the future – but that's purely speculation at this stage.

In terms of transition, OS X will be ported to x86, and will almost certainly be 64-bit ready out of the box. This is not necessarily a massive task, as OS X has always had builds that could run on x86. The challenge will be porting software to the new architecture. This is a bit of a mixed bag, depending on how the software has been written.

If the software is written in Apple's Cocoa framework, it should be relatively easy to port, as it will integrate tightly into OS X, which itself will adapt to the new hardware. If the software is older or uses a different system, then porting may be a slightly bigger job.

In the mean time, Apple will be using a cunningly-named system, called Rosetta, as an emulator that will allow old PowerPC apps to run on x86. Rosetta will directly translate PowerPC calls to x86 calls, although this will probably come with a significant performance hit. One important fact is an Intel-based Mac will still be a Mac. Apple is ostensibly a hardware company, and only uses its impressive software to sell its hardware.

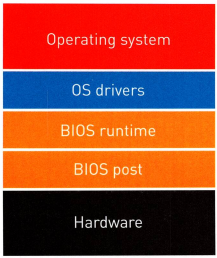
Strange business model, maybe, but that's the way it is, and that's the way it'll remain even if Apple is using Intel hardware at the core. This means you won't be able to buy a boxed copy of OS X for x86 and throw it on your PC – which is a great pity, in my opinion (imagine having a dual boot Windows/Longhorn and OS X PC...). It also means you won't be able to slap a Windows XP CD in the drive of an Intel-based Mac either.

Ultimately, an Intel-based Mac will not be that much different to a PowerPC-based Mac. You'll have to make sure you have the right version of OS X installed, but with Apple's Universal Binary system, installation CDs will probably have both versions, and will install the correct one for your platform by default. So at the end of the day, it's much like the change from Motorola's 680x0 to PowerPC – except for the ideological layer, which is pretty irrelevant really.

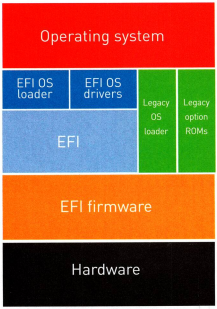
take a number of years for the transition to occur.

At the end of the day, the EFI experience will see smoother and faster boot times, a cleaner pre-boot interface instead of the ugly low resolution POST screen we're used to, more pre-boot features and easier integration with operating systems. So it's all good.

IA-64 systems, like Intel's Itanium range, already use EFI, although it's going to be a while before we see it on mainstream systems. Longhorn should support EFI straight out of the box, but Microsoft has announced that it doesn't intend to retrofit EFI to its existing, or any future, 32-bit operating systems.



▲ Currently the OS needs to go through the BIOS to access any hardware.



▲ Ultimately the EFI will replace the BIOS as the interface between hardware and the operating system.

▶ Expect to see more MIMO antenna antics in next generation 802.11n products.

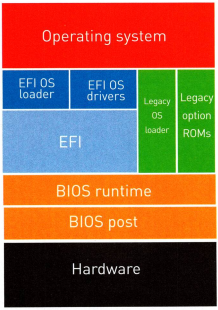
We'll likely experience a transition period, which may last up to two or three years, where the BIOS works alongside EFI on motherboards, and the OS picks the one to use on boot. Ultimately though, EFI will entirely replace the BIOS, probably some time around 2008, by which time the BIOS will be nearly 30 years old – which is almost Precambrian in tech time.

WIRELESS UPDATE

We're still a little way off seeing the new 802.11n wireless standard be ratified by the IEEE. This means more months of 'pre-n' hardware hitting the market, and more inevitable compatibility headaches when the standard does finally manifest in actual products.

The issue at the moment is not strictly which of the two competing specifications, WWiSE and TGn Sync, is superior, it really comes down to standards and regulatory issues as well as common old business and intellectual property.

Essentially both WWiSE and TGn Sync run on the same principle, called MIMO (Multiple Input Multiple Output). The idea



▲ As an interim, it's possible to sit the EFI on top of the BIOS to give the OS a choice of either one.

is to use multiple antennas to fire data over several channels simultaneously. This requires some pretty funky spatial multiplexing and interweaving of the signals to avoid interference, but bandwidth can be significantly increased in the process.

The main difference between the two standards is on the bandwidth of each channel (in this case 'bandwidth' actually refers to old school radio spectrum bandwidth, and not data throughput). WWiSE is proposing channels of 20MHz, giving a throughput of around 100Mb/s, which is mainly to help the technology pass regulatory requirements in countries like Japan and Europe where radio spectrum bandwidth is tightly controlled. TGn Sync wants each channel to be 40MHz wide, which greatly improves signal processing efficiency and increases throughput to up to 315Mb/s. However, the 40MHz channels could cause problems in Japan and Europe.

The answer may well be a compromise, with the 40MHz channels of TGn Sync, and an option to scale back to 20MHz channels where the 40MHz channels are unusable.

We should know soon enough where 802.11n is headed, although by IEEE procedures both camps now have to start from scratch and present their standards to the organisation again. With luck, the two camps will get together and work out a compromise before then, so only a single standard will be presented to the IEEE, making the necessary 75 percent supermajority vote somewhat more likely. ■

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INBOX

Got something to say?If you have a good story, an amusing anecdote or a tale of woe, we want to hear it!

DEAD PIXELS

As a retailer it is very disturbing to me having clients come back with dead pixels and not being able to help them, so I have for the last 18 months started using the Sony X-Series LCD monitors, as they have a genuine zero dead pixel policy. I have now had about eight monitors come back to me with 1 or more dead pixels and Sony have been truly wonderful, each monitor was replaced within 7-10 days and Sony also couriered the new monitors direct to my clients without any fuss. So I say Sony is still the one and only, you may pay a bit more for them but you get what you pay for: great service, great monitor and less stress when things go wrong.

S Fry

VOIPERS TAKE NOTE

I enjoyed your the article on VOIP (*June 2005, page 86*), as I had recently undertaken the technology before your article.

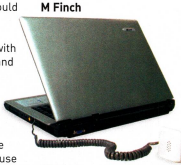
What I have found in my experience is that in theory, like your article, VOIP should work with a standard broadband connection of 512K plus (mine is 1500) with a router and an ATA box and port forwarding.

Unfortunately this isn't the case to be truly VOIP compatible. In my experience the 2 VOIP providers I've now attempted to use have had very poor call quality on my very 'common' hardware (being a Dlink DI624 and a Zyxel 2002.) Apparently because the DI624 has no SIP ALG support and QOS prioritisation this is the reason for calls not connecting inwards and poor to medium glitchy quality outbound.

I just wanted your readers to not assume that it's 'that easy' and to do it properly, you should really have a modem/router/ATA with these capabilities inbuilt/standard.

The only one I've found that's fully integrated and I mean fully integrated (say goodbye to the 3 boxes) is the yet to be released (at time of print) Billion 7402 including wireless!

M Finch



SMALL RELIEF

The problem of small, hard to see or read icons and text at higher resolution, as mentioned by J Shah (*June 2005, page 23*), is not confined to only that brand of LCD screens, it is common with most brands, especially for those with impaired vision.

Relief is available through a program called Liquid View from Portrait Displays. It will scale the size of text and icons in both desktop and apps for enhanced viewing without losing the value of higher resolution. There are six settings available. See Portrait Displays www.portrait.com

B Rough

MORE RELIEF

In the June 2005 Inbox, J Shah complained about the poor quality of their LCD screen display at higher resolutions.

I drive our home entertainment from a PC to a large, wide screen SHARP LCD TV. Initially I was disappointed with and frustrated by the quality of the display. Like J Shah, I found text blurry and poorly defined at higher resolutions. It also ran off the screen at low resolutions.

However, a little bit of 'check your settings' (Right-click the desktop and then select Properties | Settings) worked wonders. I had to experiment a bit with the settings offered by the graphics card (a humble ASUS A9250), but in the end came up with a solution at 1280 x 768 resolution that is nothing short of impressive.

P duParte

CLEARLY HELPFUL

I am writing in regard to the letter by J Shah in June 2005 – I too had the same problem. I went to display properties,

STAR LETTER: AUDIO BOOKS

It is probably too late, but may I suggest that it would have been of interest to many if your review included the suitability of the various players for audio books.

A list of desirable features for audio book players can be found at: www.audiobooksforfree.com/xMP3/default.asp

One of the most important features would be the ability to bookmark the place reached in listening to a file and then be able to resume at that point later.

For example, after listening to 37 minutes of a 55 minute audio book or recorded lecture, it should be possible to restart sometime later at that point in that file without having to use fast forward and trying to find the place again.

FUNTWIST MP3 BUNDLE!

This month's Star Letter takes home a prize bundle worth $348 from Bluechip Infotech. The pack consists of the D-Chord 240 512MB and the D-Chord 225 256MB.

For more information check out: www.bluechipit.com.au or phone 1300 72 74 74.

▲ Liquid View can help scale text, while still preserving your screen resolution.

then appearance, then effects, and used the following method to smooth the edges of screen fonts in XP, and changed to ClearType.

And if you go to www.microsoft.com/typography/ClearTypePowerToy.mspx, Microsoft has a program that helps you tune Clear Type.

Cheryl

HOOK ME UP

I'm from Port Moresby, Papua New Guinea. I have recently started buying your magazine from the local supermarket and think it is very informative. I have a hobby of collecting 'out of fashion' hardware, from peripherals, cables, mice, monitors to internal components. Can you hook me up to some suppliers or distributors who can be able to send me some of these items?

G Avosa

David Kidd replies:

Aside from car boot sales or online auctions, your best bet is the classifieds. If any other readers can help, let me know and I'll hook you up.

HEATED ISSUES

Many computer enthusiasts know that CPU and chipset temperatures reported by motherboards must be taken with one very large chunk of salt. Forum posts and personal experience indicate that errors of 10 degrees Celsius should be expected while errors of 20 degrees are perfectly common.

This huge discrepancy is a source of frustration for many. Time and time again I see forum posts where someone has taken delivery of a new computer then proceeds to freak out when the motherboard reports an absurdly high CPU temperature. Funnily enough, you also come across happy souls who believe their CPU operates around ambient temperature under full load.

Wouldn't it be great if manufacturers produced motherboards that gave accurate temperature readouts? Then we'd know when our computers are really in trouble. Computer enthusiasts and overclockers wouldn't know what to do with their excitement – being able to make direct comparisons with other people's systems and all (taking ambient temps into account of course).

Accurate temperature sensors are not expensive and I believe many, many consumers would be happy to pay that tiny bit extra.

D Black

CONGRATULATIONS

First of all I would like congratulate you on a great magazine that you are providing us with. I am a student in Auckland currently pursing a degree in Information Technology, and I find the magazine very helpful, at all times keeping me up to date with technology. I have been buying *PC Authority* for a long time now and every time the magazine is better then before.

Your software and hardware reviews are awesome, and have helped me to make excellent decisions on which ones to buy. The July edition is outstanding, especially the cover feature. I am upgrading my whole PC but with the tests I am now going to build a gaming PC by myself. The guide has made it very easy for me to actually see which hardware would perform best with each other. All I have to do is just go out and buy the components.

Once again thanks for a marvelous magazine and keep up the excellent job.

S Satishwar

GETTING IN TOUCH

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PC Authority extends a hearty congratulations to this month's competition winners. We've had a tremendous response to our competitions, and we'll be sure to keep the prizes coming.

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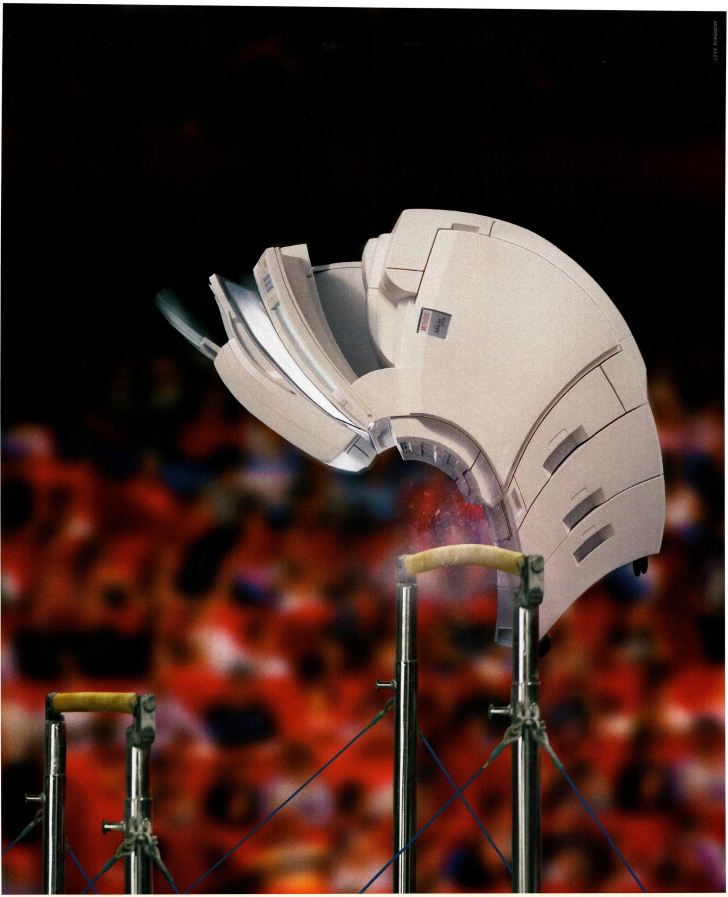

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THE INVESTIGATOR

When is a squat not a squat? David Hellaby looks at the rights and wrongs of cybersquatting in Australia.

There have been several high profile cases of cyber squatting in recent years involving people who registered domain names using the names of famous people or well known products. In most cases their purpose was to make money by selling the domain to the person or organisation who name they had used or to prevent somebody else from legitimately using it.

The majority of cases involved .com domains, however, reader Andrew Robertson thought he had come across a case involving a .com.au and asked us to look into it.

Andrew said he had been working on a project for two years based around a particular .com.au domain name, but when he went to register the name he found it was already taken. A visit to the website indicated it was for sale – something Andrew believed to be illegal. However, complaints to Australia's domain name authority auDA got him nowhere. The Authority refused to take any action.

But why not? Under Australian domain name regulations nobody can sell a domain name – a fact confirmed by auDA chief executive Chris Dispain who said any attempt to sell one was evidence of bad faith and was likely to result in the name being forfeited.

Here to help

We welcome consumer complaints and questions, and we'll do our best to help find a solution for all parties involved. If you're the victim of poor sales, dodgy service or any other kind of dispute, we need to hear about it. If you'd like our help, email us at: **investigator@pcauthority.com.au**.

Please note that the companies or individuals mentioned here are meant to illustrate the typical problems that an ordinary consumer could face. If a company is mentioned here it shouldn't be taken as an indication that incidents described are typical of that particular company.

Please don't use the *PC Authority* or The Investigator name as leverage to get more than you are entitled to.

MikeRoweSoft

One of the most famous cases of recent times has been Microsoft's dispute with a teenager, Mike Rowe, and his www.mikerowesoft.com website. The 17-year old used the domain name as a front for his budding web design company, but was asked by Microsoft to take it down. To sweeten the deal, the company also offered a whopping $10 to Mike Rowe as part of the settlement. Rowe went straight to the press and gained worldwide recognition for his plight, prompting Microsoft to make a firmer offer of an Xbox, assistance to set up a new site, free training for a Microsoft certification, and a holiday for his family to visit Redmond.

So how was this case different?

A search of the Australian Securities and Investments Commission's business and company name database revealed the answer. The domain name was also a registered business and it was the business for sale, _not_ the domain name. There also was no evidence that the domain name had been registered purely to prevent other people from using it as it had been an active website that had gone into recess. In fact, since Andrew's complaint it has become active again.

So what are the rules for registering a .com.au domain name in Australia?

First, you have to show that you have a right to use the name and that usually means that it is representative of your registered business, company, or trademark or it is your own name. Domain names are allocated on a first come, first served basis, so if two businesses have similar names the first one to apply for the name gets it, providing they meet the registrar's criteria.

In the case of the new geographic domain names you have to prove you have a connection to the location. In other words, if you wanted to register www.bongaree.com.au you would have to prove you operated a business with Bongaree in the name, or one that was located there.

Domain names do not have to be used to establish a website – they are often just used for email – and, according to Dispain, do not have to be used at all as long as they are not shown to be intentionally preventing somebody else from using them. They cannot be sold because, like software, you don't own them you only licence them and you have to renew that licence at regular intervals – usually every two years. If you do not renew your registration the licence lapses and somebody else can register the name.

However, last year there was a change of policy relating to the transfer of domain names. Dispain says Change of Registrants Policy number 2004/03 spells out how domain names can be transferred when they are the assets of a business that is sold; changes its status within a corporate group or goes into liquidation. The new policy, which can be found in the policy section of www.auda.org.au, also details how the domain can be transferred in the event of the registrant dying or going insane. ■

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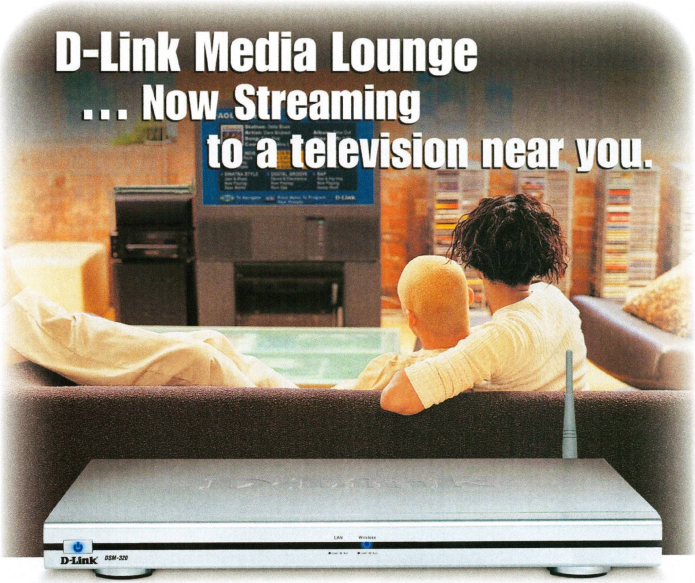

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The Perfect Notebook!

Enjoy Bright Dot Free Viewing Experience with ASUS Notebooks

The first thing that everyone should do with a brand new notebook is to check for dead pixels on the display. Since dead pixels are quite common on LCD (liquid crystal display) panels and display test runs before purchase are not always an option, shipping for a notebook can be a frustrating experience. Once purchased, even if defective pixels are found, free panel exchanges are often out of the question as most notebook companies do not have a clear warranty policy. Therefore, in the best interest of consumers, it is important to check before purchase if the notebook brand offers a solid quality warranty.

Imagine you were doing bookkeeping on Excel and mistook a dead pixel for a decimal point. Surely, that won't get you up the corporate ladder. So what do you know about LCD dead pixels and what can you do about these annoying twinkle stars?

ASUS ZBD - Zero Bright Dot Policy

So is there a notebook company out there that would commit to a solid promise of bright dot free LCD panels? The answer is yes! ASUS is the fast to stand out and make a promise to users worldwide that guarantees LCD panels with zero bright dots in three notebook models, including the W1, V6 and M6 series.

Even if only one bright dot is found, a free panel exchange is guaranteed within 30 days of original purchase!

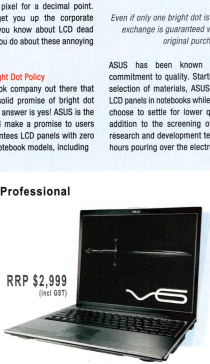
ASUS has been known for its unyielding commitment to quality. Starting from the careful selection of materials, ASUS uses only the best LCD panels in notebooks while most manufacturers choose to settle for lower quality standards. In addition to the screening of panels, the ASUS research and development team spent numerous hours pouring over the electronics circuit design to make sure that every LCD panel will run smoothly without electronics interference.

The ASUS ZBD Policy is a promise of perfection. It demonstrates ASUS' confidence in product quality management as well as its determination to become the best provider of the high-quality 3C solutions. Users can now shop for ASUS notebooks with complete confidence for total satisfaction. Next time when you shop for a notebook, be sure to look for the ASUS notebooks with Zero Bright Dot Policy guarantee!

LCD ZBD
Zero Bright Dot

ASUS recommends Microsoft® Windows® XP Professional

RRP $2,699 (incl GST)



RRP $2,999 (incl GST)

RRP $3,999 (incl GST)

: : Digital TV Tuner Built - In : :

M6020A
LCD ZBD
Zero Bright Dot

Microsoft® Windows® XP Professional
Intel® Pentium M Processor 750 1.86GHz
Clock Speed: 1.86GHz
Cache: 2 MB L2
Intel® 915PM Chipset
915GM Integrated Graphics
15.4" WXGA TFT Display, Widescreen
Built-in DVD-Dual Drive with Dual Layer
60GB Hard Drive, 512MB RAM
Includes ASUS Optical Mouse & Carry Bag

V6010V
LCD ZBD
Zero Bright Dot

Microsoft® Windows® XP Professional
Intel® Pentium M Processor 740
Clock Speed: 1.73GHz
Cache: 2 MB L2
Intel® 915PM Chipset
ATI Mobility™ Radeon™ X800, 64MB
15.1" SXGA TFT Display, Widescreen
Built-in DVD-Dual Drive
60GB Hard Drive, 512MB RAM
Includes ASUS Optical Mouse & Carry Bag

W1010G
LCD ZBD
Zero Bright Dot

Microsoft® Windows® XP Professional
Intel® Pentium M Processor 745 1.8G
Clock Speed: 1.8GHz
Cache: 2 MB L2
Intel® 855PM Chipset
ATI Mobility™ Radeon™ 9700, 64MB
15.4" WSXGA+ TFT Display, Widescreen
Built-in DVD-Dual Drive with Dual Layer
60GB Hard Drive, 512MB RAM
Includes ASUS Optical Mouse & Carry Bag

ASUS Global Zero Bright Dot Policy
With unyielding commitment to quality, M6A, V6V & W1G guarantees a bright dot free viewing experience. With proof of purchase*, even if just one single bright dot is found, a free panel exchange is guaranteed within 30 days of original purchase!
*Purchase receipt or other proof of purchase is required for the ASUS notebook Zero Bright Dot warranty eligibility. Dark Dot is excluded.

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THE A-LIST

Only the absolute best of the best make it to The A-List. Also, check out the Upgrade Guide on *page 34*, telling you what spec to aim for when buying or upgrading your PC.

NOTEBOOK

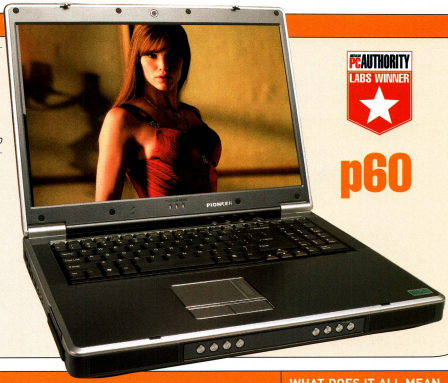
Pioneer Dreambook Power 900

PRICE: $4499
SUPPLIER: Pioneer (02) 9690 2888
ISSUE: Labs Winner, *August 2005, page 60*

What we said:

The Pioneer DreamBook Power 900 is a locally built monster – this isn't a desktop replacement, it's a desk.Thanks to the benchmarks, it blew away the competition to win our multimedia notebook roundup.

NEW



PC AUTHORITY LABS WINNER

p60

MP3 PLAYER

Rio Carbon 5GB

PRICE: $419.50
SUPPLIER: Expansys (03) 8415 0848
ISSUE: Labs Winner, *August 2005, page 84*

What we said:

The Rio Carbon was the first MP3 player to offer a 5GB hard disk, its looks went from 'dodgy plastic' to 'iPod-killing chic', and its superb navigation skills got even better. As an all-round player, few will go wrong with Rio's gem.

NEW

PC AUTHORITY LABS WINNER

p84

WHAT DOES IT ALL MEAN...

LABS WINNER

PC AUTHORITY LABS WINNER

These awards are given to the products that truly excel in a group comparison situation. These products have beaten every other similar product in its category. More than anything, Labs Winners have impressed the Labs team and are worthy of purchase.

RECOMMENDED

PC AUTHORITY RECOMMENDED

Products given this award are either second to the Labs Winner and may have been awarded for exceptional perfomance, value or features, or may have been reviewed as a standalone product but impressed the Labs team. Recommended awards come from the Labs team's extensive experience.

COMPACT CAMERA (7-8MP)

Samsung Digimax V700

PRICE: $899
SUPPLIER: Adeal (03) 8369 4444
ISSUE: Labs Winner, *June 2005, page 72*

COMPACT CAMERA (5MP)

Sony Cyber-shot DSC-W5

PRICE: $599
SUPPLIER: Sony (02) 9878 9712
ISSUE: Recommended, *June 2005, page 47*

PERFORMANCE PC

Modtech Civic-64FX

PRICE: $6400
SUPPLIER: Modtech Computers 1300 303 928
ISSUE: Labs Winner, *January 2005, page 103*

CONSUMER NOTEBOOK

Targa XTender A510

PRICE: $2150
SUPPLIER: AKA Tech (02) 9896 5688
ISSUE: Labs Winner, *March 2005, page 68*

PCI-E GRAPHICS CARD

PowerColor X800 XT

PRICE: $749
SUPPLIER: Australia IT 1300 668 715
ISSUE: Labs Winner, *February 2005, page 69*

INTERNAL HARD DISK

Maxtor DiamondMax 10

PRICE: $173
SUPPLIER: Maxtor (02) 29369 662
ISSUE: Labs Winner, *July 2005, page 90*

SOUND CARD

Creative Sound Blaster Audigy 2 ZS Platinum Edition

PRICE: $499
SUPPLIER: Creative (02) 9021 9800
ISSUE: Labs Winner, *November 2004, page 75*

DVD BURNER

LG GSA4120B

PRICE: $369
SUPPLIER: LG Electronics 1800 643 156
ISSUE: Labs Winner, *February 2005, page 87*

COLOUR LASER PRINTER

Kyocera Mita FS-C5016N

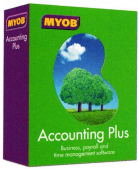
PRICE: $3848
SUPPLIER: Kyocera Mita 1300 364 429
ISSUE: Labs Winner, *April 2005, page 64*

FAST RESPONSE TFT

BenQ FP71V+

PRICE: $799
SUPPLIER: BenQ (02) 9714 6800
ISSUE: Recommended, *June 2005, page 41*

ACCOUNTING



MYOB Accounting Plus v15

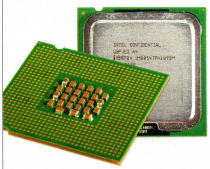
PRICE: $595
SUPPLIER: MYOB 1300 555 111
ISSUE: Recommended, *July 2005, page 54*

MULTIFUNCTION PRINTER

Canon PIXMA MP780

PRICE: $599
SUPPLIER: Canon (02) 9805 2000
ISSUE: Labs Winner, *May 2005, page 90*

HIGH PERFORMANCE CPU



Intel Pentium 4 3.7EE

PRICE: $1694
SUPPLIER: Intel
ISSUE: Recommended, *May 2005, page 70*

BUDGET PROJECTOR

Hitachi PJ-TX10

PRICE: $1899
SUPPLIER: Hitachi 1800 032 689
ISSUE: Labs Winner, *July 2005, page 74*

OFFICE SUITE

OpenOffice 1.1.2

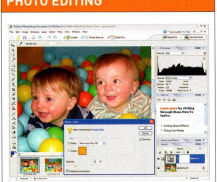
PRICE: FREE
SUPPLIER: OpenOffice www.openoffice.org
ISSUE: Labs Winner, *January 2005, page 78*

WEB BROWSER

Mozilla Firefox 1

PRICE: FREE
SUPPLIER: Mozilla.org
ISSUE: Recommended, *March 2005, page 50*

PHOTO EDITING



Adobe Photoshop Elements 3

PRICE: $179
SUPPLIER: Adobe 1300 550 305
ISSUE: Recommended, *January 2005, page 53*

INTERNET SECURITY SUITE

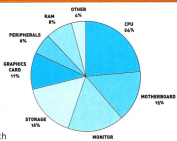
F-Secure Internet Security 2005

PRICE: $125.28 for first year; $87.80 thereafter
SUPPLIER: Open Systems (02) 6261 4900
ISSUE: Labs Winner, *April 2005, page 79*

A-List: Upgrade Guide

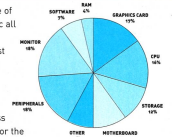
While our A-listed products give a good summary of individual products, we recognise that many users have different requirements, especially in the case of components. We've broken down the most common areas that PC builders will look at when upgrading their PCs and assigned target prices for each category. Home users or those after a basic workhorse system will find the budget PC to better cater for their needs; business users will find a more comprehensive setup in the mid-range; and those after a top performer for games or digital creation will find the performance PC to their liking.

BUDGET PC



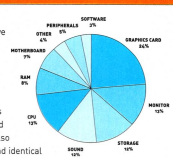
Unlike previous months, we managed to hit our $1000 target this is thanks to price drops on some key components like the Athlon 64 3000+, RADEON 9550 graphics card, and the half gig of RAM. The 64-bit CPU is a good investment, even at the lower end, as it offers good performance now, and it'll cope with 64-bit apps in the future. While the 9550 is getting a little dated, the 512MB RAM should also see you through another 12 months. Again, we've opted to go with Fedora Core 3, because it's free and one of the better Linux distributions we've reviewed. Add $135 to the price if you'd like to add Windows XP Home to the package.

MID-RANGE PC



We blew out the budget by a couple of bucks, but this system is a fantastic all rounder for the price. The 6600GT will cope with the many of the latest games and, after trying to squeeze a higher spec'ed CPU into our budget, we settled for the very capable 3200+ Athlon64 from last month. Additionally, the PCI Express board is another good investment for the next generation of graphics cards if the 6600GT doesn't suit. We also stuck with the 17-inch LCD screen, but given that it represents a fairly large chunk of the cost, you can save a couple of hundred by sticking with a CRT. Again, we've used Windows XP Home, but switching to Linux will also deliver some savings.

PERFORMANCE PC



We're still looking at AMD for performance, and with the savings we had last month where we came well under budget, we boosted up the engine slightly to an Athlon64 3700+. It's not only well-priced, but offers good performance and overclocking. After the CPU, the next component is graphics, and our PCI-E motherboard more than caters for this. As the it also supports SLI, you can opt for a second identical card for a further performance gain, although this would break the budget. Alone this card is more than capable of eating games, so you might not want to upgrade straight away, unless it's purely for show.

Budget PC

TARGET PRICE: $1000

COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Midi tower	350W PSU; 3+ bays; front USB	$60
• CPU	AMD Athlon 64	3000+; 1.8GHz 512KB L2 cache	$236
• MOTHERBOARD	NVIDIA nForce3 chipset	USB 2.0; 6 channel audio; AGP 8x; 10/100 Ethernet	$154
• RAM	512MB PC3200 DDR	400MHz DDR SDRAM	$75
• GRAPHICS CARD	RADEON 9550	AGP; 128MB DDR RAM	$110
• MONITOR	17in CRT	1024 x 768 @ 85Hz minimum	$168
• SOUND CARD	Integrated sound	Integrated in motherboard	$0
• SPEAKERS	None	None	$0
• HARD DISK	80GB PATA	7200rpm; Parallel ATA; 2MB cache	$100
• OPTICAL DRIVE	CD-RW; DVD-ROM IDE	52x CD-RW; 16x DVD-ROM	$60
• NETWORKING	Integrated 10/100	Integrated in motherboard	$0
• MOUSE	Basic mouse	Optical; 2-button; wheel; USB/PS/2	$18
• KEYBOARD	Basic keyboard	104-key keyboard	$18
• OPERATING SYSTEM	Linux	Fedora Core 3	$0
• PERIPERALS	N/A	None	$0
• WARRANTY	Standard	3 years RTB	$0
Total			$999

Mid-range PC

TARGET PRICE: $2000

COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Midi tower	350W PSU; 4+ bays; front USB	$170
• CPU	AMD Athlon 64	3200+ 2.0GHz; 1MB L2 cache	$314
• MOTHERBOARD	nForce 4 chipset	USB 2.0; 8 channel audio; PCI-E; RAID; Gigabit Ethernet	$221
• RAM	512MB PC3200 DDR	400MHz DDR SDRAM	$75
• GRAPHICS CARD	NVIDIA 6600GT	PCI Express; 128MB DDR RAM	$332
• MONITOR	17in LCD	1024 x 768 @ 85Hz minimum	$363
• SOUND CARD	Integrated sound	Integrated in motherboard	$0
• SPEAKERS	2.1 speakers	25W RMS 3 piece	$65
• HARD DISK	120GB SATA	7200rpm; Serial ATA; 8MB cache	$135
• OPTICAL DRIVE	DVD+/-RW	16x DVD+/-R/RW dual layer	$110
• MOUSE	Basic mouse	Optical; 2-button; wheel; USB/PS/2	$22
• KEYBOARD	Enhanced keyboard	Ergonomic or extra functions	$60
• OPERATING SYSTEM	Windows XP	Home Edition	$135
• PERIPERALS	N/A	None	$0
• WARRANTY	Enhanced	3 years on-site same-day	$0
Total			$2002

Performance PC

TARGET PRICE: $4000

COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Midi tower	350W+ PSU; 5+ bays; front USB	$150
• CPU	AMD Athlon 64	3700+; 512KB L2 cache; 2.2GHz.	$515
• MOTHERBOARD	NVIDIA nForce4 chipset	Dual channel DDR; 7.1 audio; USB 2.0; 2x Gigabit Ethernet; SATA RAID; 2x PCI-Express	$266
• RAM	1GB PC3200 DDR	400MHz DDR	$308
• GRAPHICS CARD	NVIDIA GeForce 6800 Ultra	PCI-Express; 256MB DDR	$950
• MONITOR	17in LCD	1,280 x 1024 max resolution 8ms	$528
• SOUND CARD	7.1 PCI	24-bit; 7.1 output; EAX	$200
• SPEAKERS	7.1 surround speakers	7 satellites; 1 sub-woofer; 92W RMS	$260
• HARD DISK	2x 200GB SATA	7200rpm; ATA/150; 8MB cache	$375
• OPTICAL DRIVE	DVD+/-RW	16x DVD+/-R/RW dual layer	$110
• NETWORKING	Integrated Gigabit Ethernet	Integrated in motherboard	$0
• MOUSE	Optical mouse	Optical; wheel	$50
• KEYBOARD	Enhanced keyboard	Ergonomic or extra functions	$150
• OPERATING SYSTEM	Windows XP	Home Edition	$135
• PERIPERALS	Game device	Joystick/gamepad/wheel	$0
• WARRANTY	Standard	3 years RTB	$0
Total			$3997

Please note that prices are subject to change and you may find prices differ from your local retailer. As always, we recommend you shop around for the best deal and if you've found a bargain, let us know at: **alist@pcauthority.com.au**.

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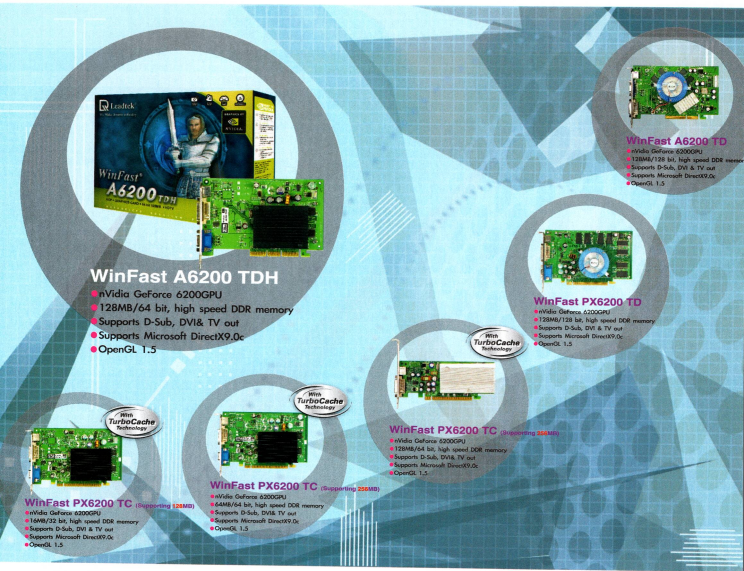

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IN THE LABS

Want the best advice on what to buy?
Check out what's been through our Labs this month.

NO ONE TESTS TECH LIKE PC AUTHORITY

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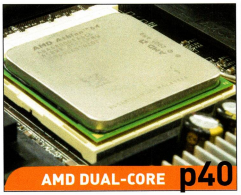

AMD DUAL-CORE p40

PROJECTORS p47

HOW WE TEST

Ever wondered which benchmarks we use to test the PCs, notebooks and peripherals?

THE BENCHMARKS

PCMark04
This strains and tests a machine's subsystems from CPU, RAM, HD and the whole.

3DMark03
An update to the benchmark, this version takes graphics performance to the next level.

3DMark2001 SE Pro
An old standard, this bechmark flogs a video card's DirectX 8.0 capabilities.

3DMark05
The hardest yet, '05 taxes even the most capable system. We've yet to see this run well.

MobileMark2002
We use this tough benchmark to strain a notebook and it's battery to the limit.

Doom 3
An industry defining game, Doom 3 gives us a 'real-world' test of a system's capabilities.

THE YARDSTICKS

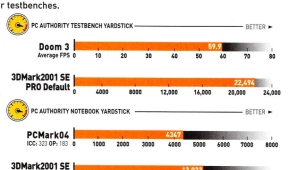
The yardsticks are used to test the equipment we get in for review, and are also used as yardsticks to gauge the performance of the PCs and notebooks sent in to us. The technology in these is refreshed frequently, and a big thank you goes out to ASUS, Altech, ABIT, AMD, Achieva and Western Digital for supplying the hardware used in our testbenches.

System

AMD Athlon FX-55 2.6GHz; 1GB DDR400 RAM; ASUS AV8 Deluxe motherboard; 256MB RADEON X800XT Platinum Edition; 2 x WD 74GB SATA HDDs; Windows XP Pro.

Notebook

AMD Athlon 64 3400+ 1.8GHz processor; 1GB DDR; 60GB HDD; ATI Mobility RADEON 9700 128MB graphics; Windows Media Center.



VIEW FROM THE LABS

Doing the hokey-pokey

I've been contemplating upgrading my system for some time now, but like many of you there are many considerations that have been holding me back. I've got a modest little machine at home – just under a TB of storage and 1.5GB of RAM, but the graphics and CPU are now dated – it's a GeForce 5950 Ultra with a 3GHz Pentium 4. It's not bad actually, but as a geek I have a perceived need to upgrade, even if my PC is working fine.

I would ideally like to upgrade to a PCI-E graphics card so I can tweak more pixelly goodness out of my games, though. Everything else in my machine seems to be ticking along fine, although the components are getting a little dated. So my upgrading woes are as follows: if I upgrade my graphics to PCI-E then I need an entirely new motherboard, an entirely new processor, and some entirely new DDR2 RAM. That's a hell of a lot of upgrading for just a few extra pixels, so the tricky part has been convincing myself of my dire need to upgrade.

I haven't been completely successful, but at least I have conceded that an upgrade is inevitable.

Now I'm wondering if I should go the whole hog and not just get the basics of an upgrade, but to aim much higher. Do I then go for go for a dual-core CPU, or a single-core 64-bit processor? Should I get an SLI mobo just in case I win Powerball in the interim and can suddenly afford a second graphics card: and RAM, just how much RAM is going to be enough now?

That's the thing about upgrading – usually you can squeeze new components in and out of your machine and just bump it up incrementally, but the advent of PCI-E (and my desire to improve my graphics) means it's time to overhaul an entire system. This doesn't happen very often, and although I find the concept fiscally daunting I know it will be worth the plunge.

On the subject of swapping out components, this is regretfully my last issue of *PC Authority*. It has been a wild and fun three-and-a-half years on the magazine, and to run with the bad metaphor I've seen the mag upgrade and overclock in this time to the awesome tome you hold in your hands right now.

PCA is stronger and better than it's ever been, and I've no doubt whatsoever that even greater things are on the horizon.

Look well, for this is the last time you'll be seeing these bleary red eyes in the magazine.

NVIDIA GEFORCE 7800 GTX

PRICE: $TBA

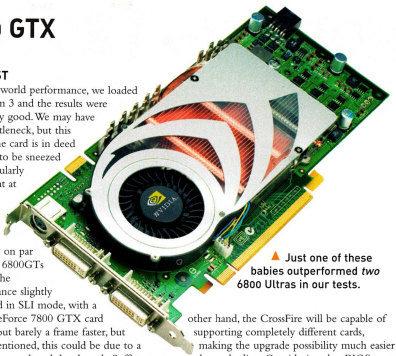
LABS VERDICT

The most powerful card to pass the PC Authority Labs. ATI's CrossFire will have to be something special to top it.

PREVIEW

A little over a year has passed since releasing the GeForce 6800, and right on cue, NVIDIA's new chip is hitting town in the form of the GeForce 7800 GTX. The formerly codenamed G70 marks a breakaway from NVIDIA's previous NVxx naming scheme, and is a leap into its seventh generation of video cards.

For comparison's sake, the standard 6800 Ultra has a 425MHz core clock speed with 256-bit GDDR3 memory modules running at 1100MHz. The 7800 GTX has a tiny 5MHz increase on that, with a core clock at 430MHz and a relatively decent 300MHz increase in memory speed to 1400MHz, also with 256-bit GDDR3 modules. These numbers aren't that much of a leap, however it's in the pipelines where the magic is. The 7800 GTX has twenty-four pixel pipelines and eight vertex shaders.



▲ Just one of these babies outperformed *two* 6800 Ultras in our tests.

ON TEST

For real-world performance, we loaded up Doom 3 and the results were startlingly good. We may have hit a bottleneck, but this proves the card is in deed nothing to be sneezed at. Particularly given that at 1600 x 1200, with *one* card, it performs on par with *two* 6800GTs in SLI. The performance slightly decreased in SLI mode, with a single GeForce 7800 GTX card spitting out barely a frame faster, but as we mentioned, this could be due to a software or testbench bottleneck. Suffice to say, the results are astounding and high resolutions is where it pulls ahead.

Finishing up on 3DMark05, we finally saw the 10,000 3DMarks barrier smashed down, with AA barely affecting the performance, thanks to multi/super-sampling.

Even though this is an engineering sample, the fan noise was so quite we had to push our ear almost right against it to hear it. Running two of these is of little concern to the ears, as they're quieter than two 6800GTs.

With the heat of ATI's CrossFire in the sights, it will be very interesting to see how they stack up against each other. Currently, all of NVIDIA's SLI cards must be exactly the same brand, right down to the BIOS version in order to function correctly, if at all. On the other hand, the CrossFire will be capable of supporting completely different cards, making the upgrade possibility much easier down the line. Considering that BIOSs are updated fairly regularly, finding a card that has the exact same BIOS a year or so from the date of purchase is no easy task. Rumour abounds, however, that NVIDIA may soon lift the restriction, in response to ATI, no doubt.

Overall, the GeForce 7800 GTX is the most powerful card we've come across to date. It will be interesting to see what additional features the manufacturers have to offer with this workhorse, as that will be the decision maker in choosing one over another. If you want the fastest card available right now, the GeForce 7800 GTX should be hitting the shelves by the time you read this.

Nathan Davis

'The magic is in the pipelines. The 7800 GTX has twenty-four pixel pipelines and eight vertex shaders.'

One technological update that particularly grabbed our interest was a neat addition to antialiasing (AA). In the past, AA hasn't smoothed over the edges of transparent textures, as they only looked for the edges of geometry, not alpha channels.

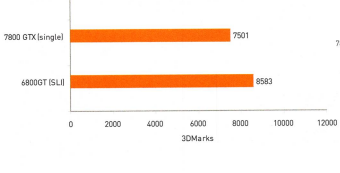
'Transparency AA' is now an option within the drivers, and textures that have an alpha channel can now have the jaggies smoothed out too.

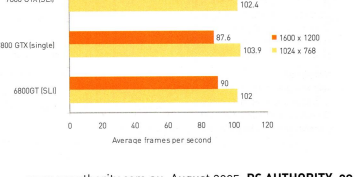
SPECIFICATIONS

Native x16 PCI Express; 430MHz core; 256MB 1400MHz 256-bit GDDR3 memory; 24 pixel pipelines; 8 vertex shaders; Shader Model 3.0; PureVideo; dual DVI; SLI capable.

SUPPLIER

NVIDIA
www.nvidia.com





AMD dual-core

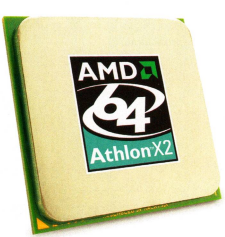
Athlon 64 and Opteron processors undergo a revolution.

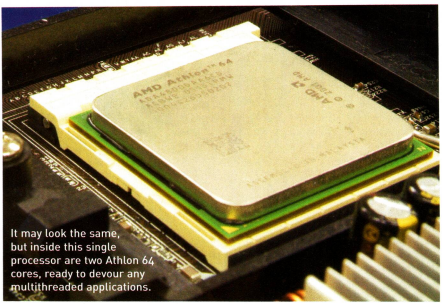
Until Intel pulled off the incredible acceleration in its product plans, it looked like AMD was going to get to dual-core first. But although the new desktop dual-core processor, dubbed the Athlon 64 X2, is behind the Pentium Extreme Edition and Pentium D in terms of release dates, it's significantly ahead when it comes to performance benefits.

The first advantage the X2 has over Intel is compatibility. Where Pentium D processors need new chipsets and VRMs (voltage regulator modules) to cope with increased power consumption, AMD is claiming backwards compatibility with existing Athlon 64 90nm-ready motherboards, with only a BIOS update required. Although dubbed the X2, the new range extends the existing convention when it comes to model numbers. The current fastest single-core part is the 4000+, and the X2 range picks up from there with the 4200+, 4400+, 4600+ and top-end 4800+.

The basic architecture and specs per core of the X2 are essentially identical to existing Athlon 64 designs. The specification of the four new processors breaks down in a similar manner to those of the 3500+, 3700+, 3800+ and 4000+, with varying levels of cache and clock speed. The 4200+ and 4400+ both run at 2.2GHz, with the 4400+ sporting 1MB of Level 2 cache per core to the 512KB of the 4200+. The 4600+ and 4800+ run at 2.4GHz, with the same Level 2 cache differential between them.

The eagle-eyed will have spotted that this means the 4800+ is essentially two 4000+ processors in one. This is distinct from the situation with dual-core Pentiums, where the cores are clocked lower to cope with thermal problems; the Extreme Edition and Pentium D run at 3.2GHz per core compared to the 3.8GHz of the single-core Pentium 4 660. AMD has managed to keep the power within the current design envelope for Athlon 64 boards by reducing the voltage per core slightly from 1.50V to 1.35V.





It may look the same, but inside this single processor are two Athlon 64 cores, ready to devour any multithreaded applications.

'The basic architecture and specs per core of the X2 are essentially identical to existing Athlon 64 designs.'

The clock speed equivalence is a definite win for AMD, since unlike Intel's dual-core parts a 4800+ should perform at least as well as the fastest single-core part for single-threaded applications. And that was borne out in our testing: directly substituting a 4000+ for the X2 4800+ yielded results that were never better than the dual-core part, even in single-threaded applications where the second core has little effect besides taking the light load of background system services. Our test setup yielded a real-world application benchmark score of 2.56 for the X2, against a marginally slower 2.50 for the single-core Athlon 64 4000+. Looking at individual scores of the applications in our test, seven are slightly faster, but not to the extent you'd expect from highly threaded applications.

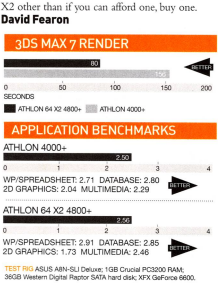
So it's marginally faster in a predominantly single-threaded environment, but of course that's not the point. Running the single-core 4000+ through our 3ds max 7 test render took two minutes, 36 seconds; plug the 4800+ into exactly the same test setup, and the same test completes in one minute, 20 seconds. Quite simply a phenomenal result.

However, that's not to say you won't feel the benefit with current applications that are only marginally aware of threading. Run two at the same time and Windows XP's accomplished load balancing will ensure that CPU-intensive applications get evenly split, giving you a more responsive system at all times.

The only downside, of course, is the price. At the time of going to press, we only had AMD's prices to go on, based on dollar values per thousand processors. The price given for a 4800+ was $1001 – around $1323 based on a straight conversion to Australian dollars – reducing to $537 ($710) for the 4200+. Compare this to the pricing of single-core parts – the 4000+ is $482 ($637) – and you can see that initially two cores will cost slightly more than two single-core parts.

But with both backward compatibility and no compromise in single-threaded performance, there's little more we can say about the top-end X2 other than if you can afford one, buy one.

David Fearon



TEST RIG ASUS A8N-SLI Deluxe; 1GB Crucial PC3200 RAM; 36GB Western Digital Raptor SATA hard disk; XFX GeForce 6800.

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Type	[+]	[-]	[+]	[-]
Write	16x	16x	16x	16x
Rewrite	8x	6x	8x	6x
Read	16x	16x	16x	16x
CD Family	**CD-RW**			
Write	48x			
Rewrite	24x			
Read	48x			
Data Buffer Memory	2MB			
Support Media	DVD: DVD single/dual layer (PTP/OTP), DVD-R, DVD+R, 4x Double Layer DVD+R9, DVD-RW, DVD+RW | CD: All CD-ROM/R/RW formats		DVD: DVD single/dual layer (PTP/OTP), DVD-R, DVD+R, 4x Double Layer DVD±R9, DVD-RW, DVD+RW | CD: All CD-ROM/R/RW formats	

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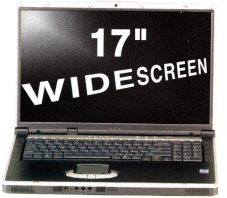

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128MB ATI Radeon 9700 graphic
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40/60/80/100GB HDD
DVD Dual Drive
Built-in Camera

G556

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Intel® Celeron® M 340 Processor 1.5GHz
128MB ATI Mobility Radeon 9700 graphic
15" 1400x1050 SXGA+ display
256/512/1024 MB DDR Memory
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40/60/80/100GB HDD
Combo (DVD+CD-RW/ DVD Dual Drive
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SCHOOL WORKS

532

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14.1" 1024x768 XGA display
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40GB HDD
Combo (DVD+CD-RW/ DVD Dual Drive

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D410J

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ECS PF88 Extreme and SIMA A9S

PRICE: $260

LABS VERDICT

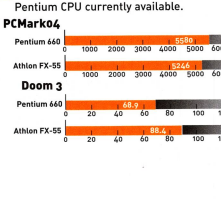
This P4 board can be adapted to support AMD chips, making it a frugal upgrader's dream.

Performance	★★★★☆
Features	★★★★★
Value	★★★★☆
OVERALL	★★★★½

As usual with a new generation of processors, it's going to be some time before the dust settles and the new champ of chips is revealed. But if you want dual-core now – and just can't wait for the definitive verdict on whether AMD or Intel wins – you're going to have to take a leap of faith. Or you could buy the PF88, which will take any current P4 and the new dual-core Pentiums (as long as you have a 450W PSU with a 19A 12V rail). But unbelievably, via a range of expansion cards, it will also take any other processor, including Pentium M and dual- or single-core Socket 939 Athlon 64.

This makes the PF88 ideal if you already own a Pentium 4 but think you might want to defect to AMD in the future, or even if you just want to future-proof yourself against new socket types. It certainly caused a bout of head-scratching around the office: AMD and Intel processors running from the same board?

There's a snag in this plan, though: the SiS965 south bridge is designed for Intel systems, which use the north bridge for 16x PCI Express operations. As such, SiS has had to create a 16x PCI Express controller north bridge for the Athlon 64, the SiS756.



▲ The PF88 will take any pinless Pentium CPU currently available.

This chip, a 939-pin socket and two RAM sockets are all held on the curious expansion card, dubbed SIMA (a meaningless pseudo-acronym). The Socket 939 card is the A9S, with ECS releasing SIMA cards for Pentium M, 745-pin Pentiums, Turion 64s and Semprons.

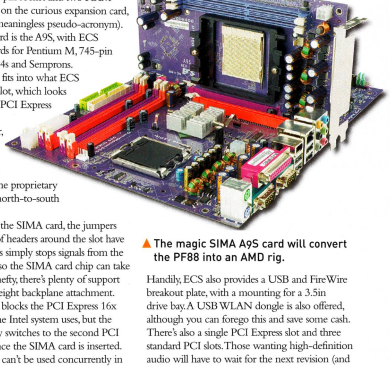
The SIMA card fits into what ECS calls the Elite Bus slot, which looks like a recessed 16x PCI Express slot with a 1x slot behind it. However, it doesn't use PCI Express technology; it's just a way of running the proprietary 1GB/s MuTIOL north-to-south bridge transport.

When inserting the SIMA card, the jumpers from the two sets of headers around the slot have to be removed. This simply stops signals from the Intel north bridge so the SIMA card chip can take over. And though hefty, there's plenty of support from the double-height backplane attachment.

The SIMA card blocks the PCI Express 16x graphics slot that the Intel system uses, but the board automatically switches to the second PCI Express 16x slot once the SIMA card is inserted. The graphics ports can't be used concurrently in an LGA775 Intel system, even if you can find a spare SLI connector.

The Pentium 4 tests went well, with an overall score of 2.12 from our 3.8GHz 570 and 1GB of Crucial DDR2 RAM running at 533MHz. This isn't quite as fast as we've seen from a 925X chipset with the same components, but the difference between 2.24 and 2.12 isn't huge when you consider that the PF88 is significantly cheaper. Disappointingly, though, we had trouble with the SIMA A9S expansion card. Ours was a very early sample and was incredibly fussy about the RAM we used – none of our usual test stock worked. We expect all these teething troubles to be cleared up by the time the board hits the shelves, but we'll just have to wait and see how forgiving the SIMA cards will be with component choice.

Quite apart from the SIMA slot, the PF88 is a well-featured motherboard. Four Serial ATA ports come from the SiS965 south bridge, while a Silicon Image 3132 chip converts two PCI Express lanes into two Serial ATA 2 ports. ECS provides a backplate for an external Serial ATA drive should you want to take advantage of the Hot Plug capability from one of these. Legacy drives can connect to the two IDE ports. There's Gigabit Ethernet for LAN connections, with FireWire and four USB ports at the back.



▲ The magic SIMA A9S card will convert the PF88 into an AMD rig.

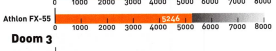
Handily, ECS also provides a USB and FireWire breakout plate, with a mounting for a 3.5in drive bay. A USB WLAN dongle is also offered, although you can forego this and save some cash. There's also a single PCI Express slot and three standard PCI slots. Those wanting high-definition audio will have to wait for the next revision (and an updated south bridge), but everyone else will find the eight-channel Realtek ALC850 codec fed from the current 965 chip more than adequate.

The PF88 is certainly an odd beast; without the Elite Bus slot it would just be a well-priced LGA775 board offering decent performance. The Elite Bus slot and SIMA cards turn it into an interesting way to add an element of future-proofing to your system. You can upgrade along any path without forking out a king's ransom for a new board and having to spend a day converting from old rig to new. Unfortunately, without being able to test the Elite Bus – and discovering whether it incurs a performance penalty – we have to reserve judgement on whether the PF88 is a great piece of engineering or just a nice idea. Expect an update soon.

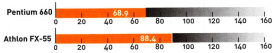
Clive Webster

'AMD and Intel processors running from the same board?'

PCMark04



Doom 3



SPECIFICATIONS

LGA775 Intel Pentium 4; SiS656 chipset; 4 x DDR2 RAM sockets, max 4GB memory; 2 x Ultra ATA/133 connectors; 4 x Serial ATA connectors; 2 x Serial ATA 2 connectors; 3 x PCI, 1 x PCI-E (1x), 2 x PCI-E; 1 x SIMA; 2 x PS/2; 2 x serial; parallel; Gigabit Ethernet; Realtek ALC850 7.1 audio.

SUPPLIER

Protac
www.protac.com.au

SHUTTLE XPC ST20G5

PRICE: $660

LABS VERDICT

A stylish and silent system which will suit many uses, from media box to games machine.

Performance	★★★★☆
Features	★★★★☆
Value	★★★★☆
OVERALL	★★★★☆

The Shuttle XPC is an icon of SFF design, and there are as many iterations as there are chipsets. The latest, the ST20G5, is based on the new ATI Xpress 200 chipset, which is designed for the Athlon 64.

Unlike some recent XPC's, this is not an enthusiast machine. Instead, it caters for the mainstream user, which can not only play games but also suits a variety of environments.

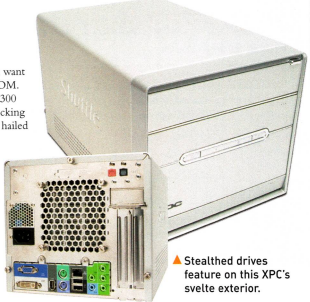
This flexibility is partly due to the fact that it's a very silent case. Apart from the 'whoosh' on startup, you'll barely know it's there. The Smart Fan is temperature controlled and will only ramp up the cooling under extreme conditions. It's a quiet and cool case – cool in both senses of the word – and is perhaps the loveliest case Shuttle has produced so far.

There is only a single IDE slot, which means playing with drive jumpers if you want to install more than just a CD-ROM. The Xpress chipset is based on X300 graphics, and unsurprisingly it's lacking in hardware grunt. Despite being hailed as the world's first DirectX 9.0 compliant barebone, it dribbled out a meagre 636 marks in 3DMark05. But it did do remarkably well in Half-Life 2, however. In our high quality test at 1024 x 768, it managed to squeeze out 29.5 fps – so it will play games, but hardcore gamers may want an after-market card.

In the tradition of previous machines, it only includes a 240W power supply, so for stability's sake a powerful graphics card isn't recommended. In the features department, it has optical audio ins and outs and utilises ATI's Surroundview for two or more monitors with an added graphics card.

Overall, the ST20G5 is a decent implementation of ATI's foray into motherboard chipset manufacture, and delivers enough features to cater for a very wide audience.

Ty Pendlebury



▲ Stealthed drives feature on this XPC's svelte exterior.

SPECIFICATIONS

Athlon 64 (Socket 939) motherboard; ATI RADEON XPRESS 200 graphics; 240W PSU; 8-channel audio; 1 x ATA133; 2 x SATA; 1 x FDD; 1 x 5.25in storage bay; 2 x 3.5in storage bays; 4 USB; 310 x 200 x 185 mm; 3.2 kg.

SUPPLIER

Altech (03) 9558 5090
www.altech.com.au

ARCHOS PMA400

PRICE: $1399

LABS VERDICT

An awesome but expensive media player with a basic PDA thrown in.

Quality	★★★★☆
Features	★★★★☆
Value	★★★★☆
OVERALL	★★★★☆

While PDAs are morphing in to media players, Archos' media player range has sprouted a PDA with Wi-Fi. The Pocket Media Assistant 400 is one hell of a media player. Sporting a crisp 3.5 inch touch screen and 30GB hard disk, the Linux-based PMA400 can record as well as play audio and video sources. Not only can you rip to MP3 or DivX and transfer it to the player, you can plug your CD or DVD player straight into the unit and hit record with impressive results. The device lacks a memory card slot, but is a USB host – letting you transfer files from a PC as well as a digital camera, memory card reader or other storage device. Combine this with the large display and you have an excellent image tank and photo viewer.

The unit also comes with a docking cradle, which allows you to charge the device, connect to a PC and connect to audio and video devices using composite or s-video. While it comes with a remote control the device can also be one, letting you schedule recordings from an external source and have the PMA400 switch the source on and even change the channel.

As a PDA, the PMA400 lacks polish but all the basic features are there and it can be synchronised with Outlook. Text input is via a stylus using handwriting recognition with predictive text, half-screen QWERTY keyboard or a SMS-like interface. Thanks to 802.11b, you can browse the web with Opera and download email. The lack of GPRS limits the PMA400's usefulness and Bluetooth for connecting to a mobile phone would add a whole new dimension to this device. Too bulky for some pockets and too expensive for many, the PMA400 is for those who crave a portable multimedia beast with a PDA thrown in, rather than the other way around.

Adam Turner

▲ A media player this good needs a PDA to remind you to stop watching The Sopranos and get to your next appointment.

SPECIFICATIONS

320 x 240, 262,000 colour LCD; USB2.0 device with 30GB hard disk; built-in mic, speaker, headphone jack, 802.11b, infrared; stereo plus composite and S-Video in/out; plays MPEG4, MP3, WMA, WAV, JPEG, PNG, GIF and BMP; records MP3, WAV, MPEG4; 125 x 78 x 20mm; 280g.

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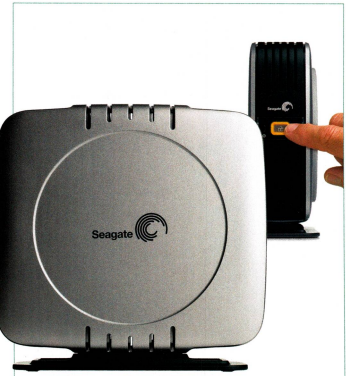

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- This product relies on your computer's functioning USB 2.0 system to achieve USB 2.0 speeds
- Supports: Windows & Mac

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Mini Flip Hub
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HP DIGITAL PROJECTOR VP6315

PRICE: $1999

LABS VERDICT

A well priced performer that'll do well in the home or office.

Performance	★★★★☆
Features	★★★★☆
Value	★★★★☆
OVERALL	★★★★☆

Hot on the heels of last month's sub-$2500 projector roundup is HP's new vp6315. The 6300 series is HP's crossover line for home theatre and business, and this particular projector is the middle ground between the 6311 and the top of the range 6325. HP hasn't set itself an easy goal by trying to straddle the line between home theatre and data projection, so we were keen to see where the compromises were.

From the outset, the bulky size and hefty 3.5kg weight is indicative of most home theatre projectors, which don't demand the same level of portability as business projectors. While this isn't so much of a problem for those after a stationary unit, mobile users will be better off with smaller units, sub-2kg units.

On the testing front, the projector also fared slightly better at home entertainment than it did at projecting text and fine detail in our data tests. Video told a different story – although slightly less vibrant than we'd have liked, it was up there with the best. For a $2000 projector, it makes a good buy for someone after budget entertainment.

Despite the seemingly home theatre focus, this has all the grunt of a business projector: 1600 ANSI lumens; 2000:1 contrast ratio; and a stock standard 4:3 aspect ratio at 800 x 600 native resolution. HP also provides a nominal 4000 hour lamp life, and the two-year lamp warranty is a nice touch too.

Overall, although it's spec'ed out as a business projector, its home theatre capability is a neat bonus. Whether it's good value for money depends on where you'll be using it – at $1999 it works neatly as an entertainer, however there are cheaper and better suited units for the business user.

Darren Ellis

▲ HP's offering for both data and entertainment.

SPECIFICATIONS

DLP projector; 1600 ANSI lumens; 2000:1 contrast ratio; 1.5 to 9.1m throw; RGB D-Sub, S-Video, Composite video input, RGB D-Sub; 1.2x optical zoom. Dimensions: 29.5 x 27.1 x 11.2cm; Weight: 3.5kg

SUPPLIER

HP 13 13 47
www.hp.com.au

CASIO CASSIOPEIA XJ-360 PRO DATA PROJECTOR

PRICE: $3495

LABS VERDICT

It's a very tiny and capable data projector, but just that little bit too expensive.

Performance	★★★★★☆
Features	★★★★★☆
Value	★★★★☆☆
OVERALL	★★★★★☆

Slightly over budget and over-specified to fit within last month's budget projector roundup (*July 2005, page 72*), the Casio XJ-360 is a very compact and very capable projector that may just be worth those extra dollars.

While not quite a fit-in-your-hand projector, the XJ-360 is small enough and light enough that even when housed within its carry-case the entire package is around the size of other data projectors without their cases. So what does this diminutive three-and-a-half grand projector offer?

Quite a bit, actually. Casio rates this DLP projector at 2200 ANSI lumens with a 1000:1 contrast ratio. While the latter's not the highest we've ever come across, especially with contrast ratios reaching 2000:1 and beyond, the former's high rating negates a lot of the contrast issues, particularly in an office environment. Under test we were very impressed with the unit's capabilities. The high brightness lent every test screen that extra bit of clarity, and although we did have to mark it down a little for contrast, we were impressed with the colour ranges and clarity of the other test screens. We did note some pixel tinning problems that were lessened with a bit of tweaking of the controls, and although there was some minor but noticeable colour streaking and misregistration with the high-contrast colour tests we didn't feel it would be a problem in any setting.

Plain text and image quality was excellent with a vibrant PC desktop, and the XJ-360 appeared happier with 3D PC graphics than it was when we shunted a DVD through it, although both are more than good enough for some extra-curricular activity.

It's very capable, very tiny, but for our money it's a little expensive. Knock a few hundred off and you have an absolute winner of a projector.

Darren Ellis

▲ About the same footprint size as a B5 sheet of paper.

SPECIFICATIONS

DLP projector; 2200 ANSI lumens; 1000:1 contrast ratio; 0.8m–5.3m throw distance; 1.5m–7.62m image size; RGB D-Sub, S-Video, Composite video inputs, RGB D-Sub pass-through. Dimensions: 23 x 5.5 x 17cm; Weight: 1.8kg

SUPPLIER

Shriro (02) 9415 5000
www.shriro.com.au

OPENOFFICE 2.0 BETA

PRICE: FREE

LABS PROSPECTS

Our pick of the low-cost office suites has a much-needed overhaul, but lacks some of its former pizzazz.

PREVIEW

In an outcome that surprised some, OpenOffice won our last office suites labs test (*January 2005, page 76*), so we were keen to see what had changed beyond the smart new splash-screen of version 2. The most obvious starting point is the whole look and feel, as this new version takes its design cues from the OS. It will look like a native Windows application on a Windows platform, a Linux application on pretty much any distribution you care to name, and a Solaris suite on Solaris. The only platform that retains the ugly look of the original is, ironically, the Mac, which continues to run OpenOffice 1 through X11, as development of a native release for that platform has all but dried up.

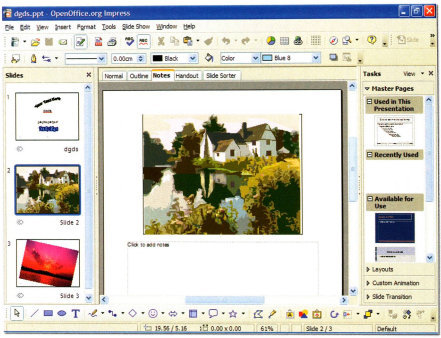
But it isn't just cosmetic. An overdue reorganisation of the menus has put common tools in more logical positions. At last, Writer's word count appears on the Tools menu, and you can also finally count the number of words in a section – not just the whole of

'We were pleased to see that the excellent Navigator hasn't been tampered with.'

your document. The only workaround for this in the past had been to copy the section into a new document and apply the count there. Toolbars can now be customised through tabs at their farthest ends, without resorting to a menu, yet curly quotes are still turned off by default, which we find rather surprising.

The suite comprises four key applications: Writer, Calc, Impress and Database, which effectively ape Word, Excel, PowerPoint and Access, plus Draw, a surprisingly good vector-drawing tool with some excellent 3D tools. Writer and Calc are where you'll spend most of your time, and they seem to be where the majority of the development resources have been spent: of the 53 new features, they keep 30 to themselves.

The range of bundled templates remains scant, but a set of Wizards (formerly called Autopilots) now helps you to create a range of documents, convert currencies and install fonts from the web. These are patchy at present, and we can only hope they're updated over time. The Letter Wizard, for instance, includes

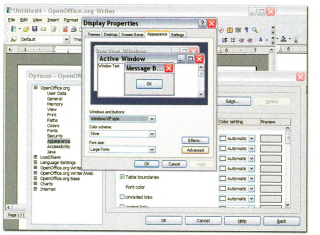


▲ Improvements to Impress' rendering of PowerPoint slides make this a sensible choice for presenters.

presets for business documents using national conventions as diverse as American, Korean and Chinese, but there's no option for British. The Mail Merge Wizard has been segregated into the tools menu, but we were impressed by how easily we were able to link it to the Windows Address Book. It was, quite literally, a two-click operation, after which we could define our own queries using the suite-wide Database. If you followed our OpenOffice workshop in our March issue, page 103, you'll know that linking data sets to your documents was formerly a highly involved process, and that you had to force an update to take hold.

Word's format painter has put in an appearance here – at last. The spell-checker, though, remains confusing. Once you've confirmed that what it thinks is a mistake really should be there, you have the option to add the word to one of three different dictionaries, called sun, soffice and standard. Your guess is as good as ours about which is best for what, and it seems to make little difference which one you post it to, although the suite does redeem itself by giving access to a massive 62 dictionaries for even obscure languages through a downloadable add-in.

We were pleased to see that the excellent Navigator hasn't been tampered with. This floating palette will have you flying through your documents, as you search oversized files on the basis of headings, table captions, OLE objects, and even formatting attributes. For anyone working on a thesis this, and the strong bibliographic tools, make OpenOffice a top choice. Another bonus, of course, is native PDF creation, saving you $580 on the cost of full-



▲ A cosmetic, yet crucial, update includes better integration with the native look and feel of the operating system.

blown Acrobat. This has been beefed up, allowing you to set percentage compression ratios and define how captured form data should be returned from readers. This alone makes it worth serious consideration in place of Word.

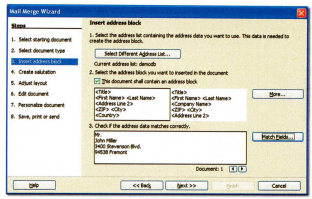
Excel, too, now has some very serious competition from Calc. In doubling the version code, its programmers have also doubled the size of the spreadsheets it can handle. Now up to 65,536 rows, it matches Excel line for line, so should overcome any problems – however unlikely – in importing files with more than the previous limit of 32,768 rows. At the same time, much of the effort you'll put into making use of these new cells has been cut. Ranges, which have always felt like something of an afterthought in OpenOffice, can now be defined through the name box, as they should.

Charts, however, remain a disappointment. They are easy to create, but still aren't as attractive as those produced by Excel, which we'd still prefer to use for financial reports. Conditional formatting remains good, and the outlining tools continue to outshine those provided by Microsoft, by putting the column and row expansion handles in far more logical locations.

Overall compatibility with Microsoft Office remains among the best on the market. There's little change in the compatibility of Writer and Calc, but improvements in Impress let it more effectively handle rotated graphics and Microsoft Word Art than its predecessor. This latter point is particularly important. It also handles transitions between slides more accurately, and although our tests showed that the smooth wipes and dissolves of PowerPoint were rendered in jerky motions, they did at least flow in the right direction, which wasn't always the case with OpenOffice 1.

Impress retains its penchant for modal operation, but with the addition of a slide-sorting pane and another panel giving you immediate access to page templates, you'll spend a lot more time looking at your work than you will the internal workings of your presentation. We were particularly impressed by the new Handout view, which builds on the flexibility of its predecessor.

But suite-wide it isn't all rosy. Macro conversion is set to be improved in StarOffice 8, Sun's commercial implementation of the OpenOffice code base, so if you've invested a lot of time writing custom scripts for your Microsoft Office documents then you'll want to wait until it hits the shelves.



▲ OpenOffice 2 sees a much needed overhaul of the mail merge wizard.

'This remains the best suite for a perfect demonstration of why you shouldn't be put off by the idea of open source software.'

The suite's file format has also changed. Rather than sport an sxc suffix, it's now odt for documents and ods for spreadsheets. Under the hood it's still XML, but we had trouble opening these new files in version 1 of the suite. If backwards compatibility is an issue, you can save as an earlier version, or in a variety of Microsoft formats, but that's missing the point.

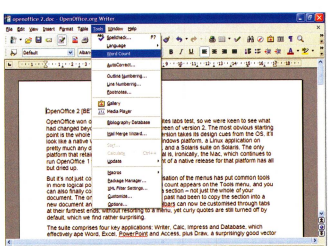
The format is actually the Oasis OpenDocument format, which is based on the former OpenOffice files but overseen by the Oasis consortium, and designed to be used as the first workable open-source file format. OpenOffice 2 is the first suite to use it as its default format but, should it gain widespread acceptance, it could one day overtake doc and xls as the industry standard. This is less unlikely than it sounds since the European Union recommended OpenOffice form the basis of all cross-platform document use.

All in all, then, there are some impressive changes here, but we can't help feeling this new OpenOffice still feels like a point-update. That's probably because we've been spoiled by Microsoft, which has to throw a lot into its bi-annual revamps to justify the price tag. That said, this remains the best suite for home users, or the cash-strapped business, and a perfect demonstration of why you shouldn't be put off by the idea of open source software: Sun has built a good reputation on its support of the project.

OpenOffice 2 is a free 82MB download, which in layman's terms is about as long as it takes to boil an egg, and half as long again as it took for version 1. Installation is a breeze, and we were pleased to see that when we unpacked the archive it contained a proper installer and four CAB files, rather than the 503 disparate packages of the previous edition.

If you're planning on jumping ship from the full-blown Microsoft Office, though, think carefully. Office 2003 sports a raft of features you won't find here, and OpenOffice has no equivalent of either the Task Pane or SharePoint, so if you use these for navigation or team-working they'll be sorely missed. But – if your money isn't yet on the counter, you'd be foolish not to at least try OpenOffice and see if it suits your needs.

Nik Rawlinson



▲ An overdue rethink of the OpenOffice menu structure sees common tools in more logical locations.

REQUIREMENTS

Windows 98/ME/2000 (SP 2 or higher)/XP; Linux kernel 2.2.13+; Solaris 8+; 128MB RAM.

SUPPLIER

OpenOffice.org via website
www.openoffice.org

LINSPIRE 5

PRICE: $109.95

LABS VERDICT

It lives up to claims of being the easiest Linux distribution there is, but is unlikely to convert users.

Ease of use	★★★★★★
Features	★★★★★☆
Value	★★★☆☆☆
OVERALL	★★★★☆☆

In 2003, we reviewed one of the first incarnations of an OS aimed at novice to intermediate users, based around Linux. At the time, it was still labouring under the name of Lindows, but legal action from Microsoft has brought about the change to the name Linspire.

The Linspire Corporation claims Linspire 5 is 'The World's Easiest Desktop Linux!'. So to give it a good acid test, we installed it on a Sony VAIO: the non-standard hardware of notebooks is often enough to trip up an OS. We were amazed at the speed and ease of the process; from installation to the first complete boot into the Linspire Desktop took just 19 minutes, and that included repartitioning and reformatting the hard disk. The process is far more hands-off than Windows XP's installation, with only a computer name and password to enter, plus the time zone.

Once the OS is installed, you're not immediately greeted with the Desktop. Instead, the system launches a full-screen audio intro, complete with cheesy voice-overs taking you step-by-step through the OS. In reality, it's more of a comfort blanket to convince you that Linspire will do everything Windows can.

Linspire is based on a Debian distribution of Linux, with kernel 2.6.10, the KDE Desktop environment and X.Org windowing system. But the look and feel is a custom affair and the Desktop itself is modelled on the XP Desktop even more closely than standard Linux distributions, with a hint of Mac OS X too. The Launch button on the bottom left sails very close to the wind, looking more than slightly similar to the XP equivalent. You'll also see an icon labelled My Computer.

▲ The Linspire Desktop: a heady blend of XP and Mac OS X.

There's a saying, among some XP users, that life's too short for Linux. But Linspire does what it can to avoid you having to spend months learning the command line. This extends to committing a sin considered a cardinal error among Linux die-hards: by default the system logs you in as an administrator. This avoids the tedium of opening a shell and issuing the su root command every time you need to tweak a system setting or install an application, but it also means the system is fundamentally more vulnerable to both user error and hackers leaving it in a non-working state. It may look fluffy on the outside, but Linux is far less forgiving than Windows when it comes to doing things that damage other things.

'Linspire will do everything Windows XP can.'

The most amazing thing about the install time is that this includes not just the base OS, but a plethora of open source and customised Linspire applications. Among them is the OpenOffice suite, instant messaging, Lssigs, CD and DVD burning, Lassist, LTorrent, the free RealPlayer 10 client, Lphoto, Ghost PDF viewer and stacks of other tools, games and utilities. It's a hotch-potch collection but does feel a little more cohesive than some other distributions, with less replication and application crossover. And if that's not enough, you can turn to the main weapon in Linspire's armoury that differentiates it from competitors, CNR, the click 'n' run system. This takes you to Linspire's web-based software warehouse, comprising a mix of popular open source applications and pay-to-download offerings. The big advantage is that it really is a click-and-run affair: literally one click downloads and installs the application you want, saving once again the spectre of the command line. The downside is that you'll need to pay a subscription charge even for downloading software, but the purchase price includes one year's access.

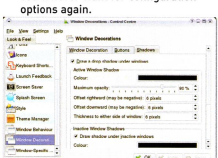
Things that used to be a nightmare in Linux and put off even relatively determined new users are solved by Linspire and its underlying components. Pop a flash drive into a free USB port and it appears on the Desktop à la Mac OS; the audio just works with no drivers required; and the story is the same with video. Although the drivers for the ATi chipset in our test VAIO were fairly generic, they worked fine with the exception of flickering on some screensavers.

So, it really is an easy-to-use, good-looking OS that will have you productive right from the start. So where's the catch? It's simply that you probably already have an OS that you're used to, is better integrated and, despite Linspire's efforts, essentially easier to use.

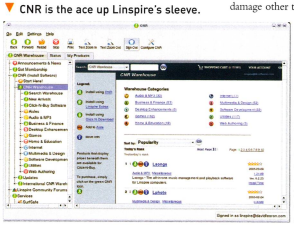
There can be only two reasons for choosing Linspire over XP: the first is financial and the second political. If you're strapped for cash or fed up with Microsoft, you'll do fine with Linspire. If not, there's no reason to switch.

David Fearon

▼ You'll never want for configuration options again.



▼ CNR is the ace up Linspire's sleeve.



REQUIREMENTS

800MHz CPU; 128MB RAM; 4GB HDD; SVGA or higher monitor; CD/DVD drive.

SUPPLIER

Everything Linux (02) 8756 3566
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Senior Engineer, Corporate IT
NVIDIA

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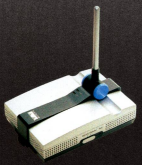

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CISCO SYSTEMS

OPERA 8

PRICE: $52 upgrade $20

LABS VERDICT

The browser that once had the potential to steal IE's crown has been outsmarted by Firefox.

Ease of use	★★★★☆
Features	★★★★☆
Value	★★☆☆☆
OVERALL	★★★☆☆

Opera has a fight on its hands. Not with IE: that one's already been lost. This time, its biggest threat is Firefox. If Opera is to tempt mass migration, it has to outsmart the open source upstart.

But there are problems. First, there's the cost: you can either put up with ads on the toolbar, or pay a fairly steep $52 to have them go away. We recommend the latter, as the former drops cookies on your PC. Opera claims that only aggregate demographic data is collected, but on the issue of the cookies themselves it says little more than 'the servers and sites that offer the banner images can send cookies, just as capably as any other image that you normally load into Opera when viewing a web document. Cookies don't originate from the Advertising.com or Opera servers.'

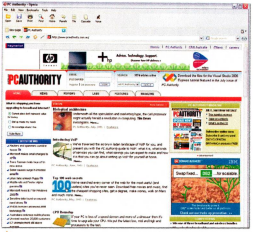
We tried logging into two major banks. Even though we set them to identify as IE, and then Mozilla, one wasn't smart enough to dodge the defences, and wouldn't let us in. The other was also a no-fly zone, insisting we'd logged out every time we tried to log in.

On a more positive note, it's very fast. It also drops an RSS icon into the address bar every time it finds a feed, so you can subscribe with a single click. This is a neat timesaver and, like the use of tabbed browsing, earns Opera extra points when compared with IE. We do wish it had stuck to the familiar <Ctrl-T> for a new tab, though, rather than the more convoluted <Ctrl-Shift-N>.

We also welcome the addition of Google searching from the toolbar, but would like to see better word searching on displayed pages. Firefox got it right with a live search on the status bar, but Opera's default of garish dialogs for this and every message is distracting. Page rendering, too, was sometimes off-kilter in our tests, with some pages that appear without issue in Firefox and IE failing to load as we'd expect.

The email client is well thought out, automatically filing incoming attachments and integrating your RSS and NNTP feeds, but is, overall, very much a mixed bag. Its worthy touches are overshadowed by shortcomings that make this a poor alternative to Firefox, the AOL Browser and, in some respects, IE. And neither does it justify its continued reliance on ads or a $52 fee.

Nik Rawlinson



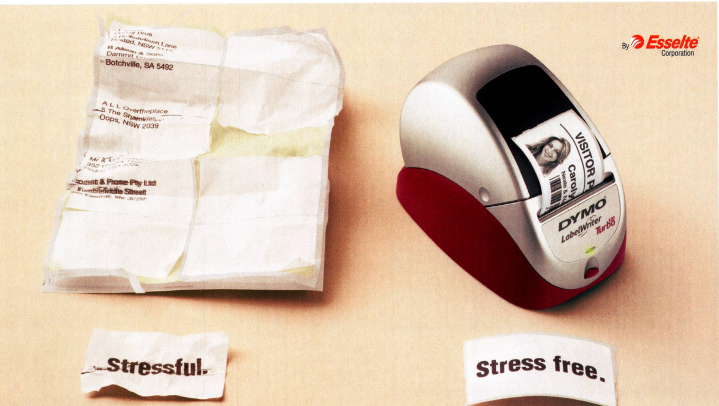
It's fast, but you'll have to put up with adverts unless you pay the $52 fee.

REQUIREMENTS

Windows 9x/NT/2000/XP; Linux; FreeBSD.

SUPPLIER

Opera via website
www.opera.com



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ROXIO EASY MEDIA CREATOR 7.5 SUPERSONIC

PRICE: $179

LABS VERDICT

Even if you only need half the features, it's good value, with 18 apps and utilities under one roof.

Ease of use	★★★★★☆
Features	★★★★★☆
Value	★★★★★★
OVERALL	★★★★☆

Roxio's Easy Media Creator has a lengthy and chequered history. Long ago it was Adaptec's Easy CD Creator. But like most CD-burning apps, it's bloated beyond recognition. This version includes no less than 18 bundled apps, covering image and video editing, DVD authoring, data backup, still-image slide-show, and a DVD player. Naturally, there's CD- and DVD-burning in there somewhere as well.

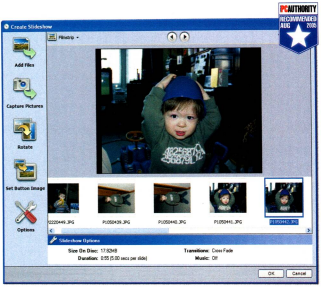
As with previous versions, the apps are managed from a vast front end organised by Music, Data, Photo, Video and DVD categories. Underneath, you can access the same apps directly rather than via tasks, and underneath that are your recent projects. It isn't as attractive to look at as Ulead DVD MovieFactory 4, but is certainly easy to use.

Music functions include CD ripping, with both Coding Technologies' and Fraunhofer's MP3 codecs, Ogg Vorbis, WAV, and WMA. There's an LP and Tape Assistant to help you record from analog media; this lets you bring in one side of an LP as one file, then split it into tracks, enhance it, and export. You can also record live audio, or burn audio and MP3 CDs.

The data section comprises disc copying and burning files to disc. Creating a backup project calls up Backup MyPC Deluxe, fully fledged data backup software capable of full, incremental and differential backups. It can also help you create a full recovery set.

The image section lets you capture stills from a wide variety of peripherals. This includes video-capture devices, as well as removable media and audio devices. Image-editing is provided by PhotoSuite 7. This offers a task-based approach to enhancing your digital photos. It isn't Photoshop but it's quick and easy to use, and there's a lot more power available than there appears to be.

Clicking on the Create Slideshow option will cause a bit of a shock, as the Sonic-branded MyDVD Slideshow appears – that's because Sonic bought Roxio. Sonic MyDVD Slideshow lets you create image sequences on DVD and VCD. As it uses the OpenDVD format for DVDs, slide shows created on this disc format can be re-edited at a later stage. However, it isn't quite as easy to use as the slide-show features within Media Studio 4.



▲ The slide-show capabilities come from Sonic MyDVD, rather than a native Roxio app.

'It would be easy to criticise Roxio for throwing far too much into one product – if it weren't for the price.'

There's also the option to create a greetings card, although that's just another view within PhotoSuite, offering collage, montage and graphical borders.

Most of the video-editing capabilities come from VideoWave 7 Professional, which has improved greatly since its MGI days. The interface is no longer over-designed, and it even supports an overlay track with keying or picture-in-picture. However, only one filter can be applied at a time, and not to any overlaid tracks, which is a rather strange and annoying limitation. It can output to a wide variety of formats, including video files, back to DV tape, or the internet, although all the settings are hidden behind wizards. For the truly lazy, there are automated video-editing options in the form of the fully automatic CineMagic or the partially assisted StoryBuilder.

DVD and VideoCD authoring is supplied by Roxio's DVD Builder. This has limited video-editing capabilities built-in as well. You can edit the video represented by each title icon on the menu, adding extra clips with transitions in between. There's an automatic chapter-detection function, although we found it was a little overzealous, finding chapter points for even fairly minor camera moves.

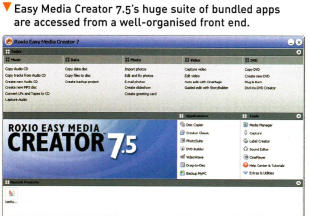
The menu design starts with predefined themes for main and chapter menus, which can then be customised. You can also move buttons around the menu and resize them, and import your own photo or video backgrounds.

New to the DVD section is the DivX-to-DVD utility. This will convert your DivX files to DVD-compliant MPEG2 VOB files, and either burn them to DVD or leave them on your hard disk to burn manually. The potential copyright issues aside, it does its job well, converting DivX to MPEG2 at near real-time on a 3GHz system.

So, there's a huge amount packed in – we haven't even mentioned the capable Label Creator, the CinePlayer DVD playback software, the Media Manager, or the Image loader, which allows you to mount disc images stored on hard disk as virtual optical drives. Some of the individual apps, such as the video editor, aren't quite on a par with the competition, and it would be easy to criticise Roxio for throwing far too much into one product – if it weren't for the price. At $179, even a few apps make the bundle good value, the street price is likely to be less.

James Morris

▼ Easy Media Creator 7.5's huge suite of bundled apps are accessed from a well-organised front end.



REQUIREMENTS

Windows 2000 (SP 4); Windows XP (SP 1).

SUPPLIER

Harris Technology
www.ht.com.au

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Ulead DVD MovieFactory 4 Disc Creator

PRICE: $199

LABS VERDICT

A great entry-level DVD-authoring app, but only of value if you don't already have burning software.

Ease of use	★★★★½
Features	★★★½☆
Value	★★★½☆
OVERALL	★★★½☆

Software vendors love suites, with everything but the kitchen sink in one bundle. Ulead's DVD MovieFactory 4 is no different, with two versions: Standard ($99) and the all-inclusive Disc Creator reviewed here. While their core DVD-authoring capabilities are the same, Disc Creator includes data and audio burning. As well as offering unlimited CD audio ripping and audio format conversion, it can create CD Audio, MP3 and DVD Audio discs.

Disc Creator also adds DVD player software, on-the-fly formatting and DVD shrinking. The latter comes in the guise of DVD Tweak and Fit. It can automatically squeeze a dual-layer DVD-Video into a single-layer space, but it can't turn DVDs into VideoCDs, as compression is limited. The DivX DVD burning utility is also less useful than it looks, as it doesn't convert your files you'll need to do this with a third-party application.

All the tools are integrated into a new interface, which is reminiscent of Mac OS X. Large icons give you access to DVD or CD tasks, plus a fully customisable favourites menu. Disc Creator also includes a Mac OS-like icon bar, which docks to the right of the Desktop to give drag-and-drop burning.

The main MovieFactory app is the primary focus of attention. This can now capture from FireWire (or a WDM device) directly to MPEG or AVI. With DV sources, it can auto-detect scene changes and split the files. There's direct support for capture from DVB-T digital TV tuners too. Pre-recorded media can be brought in as AVI, QuickTime, MPEG and WMV or ASF files. You can also import unencrypted DVD-Video and DVD-VR or +VR-format discs. Once your media is imported, there are limited editing capabilities. You can add a transition to each file and enhance video. It's also possible to add a simple title at the beginning of a clip.

▲ The main interface amalgamating the functions is reminiscent of Mac OS X.

The Multi-trim Video tools let you define multiple in and out points within a file, handy for removing ad breaks from a TV recording. Ulead DVD Movie Factory 4 also has capable still-image slide-show authoring. This even includes Pan & Zoom animation, although options are limited. The transitions are similarly restricted to just a few blocky wipes.

Digital Workshop Opus Pro XE 04.5

PRICE: $697 approx (US$529)

LABS VERDICT

A flagship authoring tool gets a worthwhile upgrade, making it a credible alternative.

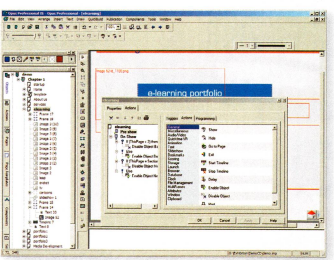
Ease of use	★★★★½
Features	★★★½☆
Value	★★★½☆
OVERALL	★★★½☆

Opus Pro XE is the most powerful in Digital Workshop's Opus range of multimedia authoring tools. It's a product with a similar depth of features to its main competitor, MatchWare's Mediator 8 EXP, but with a slightly different, more commercial focus.

Multimedia developers often want to create evaluation versions of their software; fully functional, but set to expire after a certain period. While this can be achieved with most authoring tools, Opus Pro XE makes it simple and seamless, down to allowing your users to unlock the software with a user-specific registration code.

Developers of e-learning products for commercial use will be familiar with the SCORM standard for interchanging information with learning management databases. Again, while it's possible to make a Mediator or Director application SCORM compliant, with Opus Pro it's a simple matter of selecting the appropriate publication type. You can even create a SCORM-compliant Flash application, although Opus' real strength lies in creating CD-ROMs and DVD-ROMs.

As with Mediator 8 EXP, Opus Pro XE includes Scripting support in the form of its bespoke OpusScript coding language. Scripting is more tightly integrated into Opus Pro XE than Mediator, and OpusScript is certainly more powerful than Mediator's VBScript implementation. OpusScript is based on the same ECMA standards as JavaScript and ActionScript, but is more difficult to get to grips with than VBScript. It therefore takes longer to become productive, although is more rewarding when you do. Opus Pro XE doesn't support ActiveX though, preventing it from becoming the complete authoring environment.



▲ The Opus Pro XE 04 interface provides a wealth of options.

Opus uses a drag-and-drop approach that's similar to Mediator's, along with the same Events/Actions methodology. Due to this, you can become productive quickly, although the sheer weight of features means that getting familiar with Opus Pro XE will take some time. The interface isn't, at first glance, as pleasing to the eye as

Once you've created your project, you can switch between optical, although some options such as motion menus and 16:9 aspect ratio are only available with DVDx. The Menu authoring stage gives you reasonable control over design. A library of preset styles is available, but you can use your own. Integration with the Label@Once disc-labelling app is seamless, picking up menu graphics and chapter titles automatically.

MovieFactory's output options have been beefed up. Top of the list is Dolby Digital support, making audio files smaller. DVD-VR and +VR discs can be burnt, as well as DVD-Video, plus dual-layer and 16x writing are supported. You can even create the space-saving XDVD format, which reduces the frequency of full-frame encoding to every 60 frames. This increases the length of video you'll fit on disk, but isn't entirely compatible with set-top devices. It's also possible to export videos from the timeline for use in other projects, so you don't need to encode them in each one.

MovieFactory maintains its heritage as a great entry-level DVD-authoring app, and the Standard version is good value. However, Disc Creator is only worth the extra money if you don't already have decent CD-burning software.

James Morris

REQUIREMENTS

Windows 98 SE onwards.

SUPPLIER

MatchWare, download from website
www.matchware.com

Mediator's new look, and it certainly crams a huge amount of info into a small space. It can take some time to track down a specific option among the multitabbed dialogs but, once it becomes familiar, you'll appreciate the fact that no option is more than a couple of clicks away. Unlike Mediator, it also works well on a dual-monitor setup.

This latest version of XE includes the facility to directly edit the Windows Registry from OpusScript, along with new file-management functions, the ability to disable the system screensaver and the Alt-Tab task switch. It can even detect and respond to a joystick. Finally, it's now possible to export your publication as a video file. Add this to the Mouse and Keyboard Recorder, and you can create a simple training system that may be burned to a DVD.

Opus Pro XE offers a compelling upgrade for Opus Pro 04 users looking for finer control of their publications and their deployment. Taken with the features also added to Pro in this iteration, there's enough in this new version to make it a worthwhile upgrade for existing Pro XE users. Opus Pro XE is feature rich, stable and mature: it's a fine alternative to Mediator 8 EXP if ActiveX and multi-user support aren't important.

Kevin Partner

REQUIREMENTS

Windows 98 SE onwards.

SUPPLIER

Digital Workshop, download from website
www.digitalworkshop.com

MatchWare Mediator 8 EXP

PRICE: $1185 approx (US$899)

LABS VERDICT

The best productivity and power for general multimedia, poor value for existing users.

Ease of use	★★★★★☆
Features	★★★★★☆
Value	★★★☆☆☆
OVERALL	★★★★☆☆

Mediator 8 EXP is MatchWare's latest attempt to muscle into the professional multimedia authoring market currently dominated by Macromedia Director MX 2004. It's produced in Standard and Pro versions, but it's the flagship EXP version that's of most interest to serious developers.

Mediator is a drag-and-drop authoring tool in which objects can be dropped onto a page in a similar way to creating a PowerPoint slide. That's about as far as the similarity goes however, since Mediator allows all objects to respond to Events by taking Actions. A Mediator Event might be a right mouse-button click or a page turn, whereas Actions range from a simple Show (which makes an object visible) to the Timeline action (which allows a sequence of Actions to be arranged by time). Mediator projects can be distributed on the web in HTML or Flash form, but Mediator's natural territory is in creating CD-ROM and DVD-ROM content.

The traditional downside of drag-and-drop authoring tools is that developers are limited to the built-in feature set. Since version 6, Mediator EXP has shared two features in common with Director aimed at bridging this gap: scripting and ActiveX controls. Using VBScript or JavaScript, developers can add features or control Mediator objects in code. For example, it's possible to create a Flash SWF player in Mediator, controlling navigation by using code attached to buttons.

ActiveX controls may be dropped onto the page and controlled using script. Although ActiveX is a relatively old technology now, its longevity means there are thousands of pre-created controls on the market. For example, it's possible to use the Common Controls ActiveX to display Open/Save and Color Dialogs among many others. All of a sudden, you're able to create simple dynamic applications in Mediator.

The most obvious change in version 8 is an overdue facelift. The new interface is slicker and more efficient, bringing Mediator's look and feel bang up to date, complete with dockable, customisable toolbars and a scrollable workspace. Disappointingly, though, Mediator still doesn't support a dual-monitor setup. It would be incredibly useful to work on one screen while viewing the results on the other.

Version 8 of both Pro and EXP support multi-user editing, meaning a number of users can edit a document concurrently over a network, as long as they don't try to edit the same page. This feature is likely to be most appreciated in the school setting, where Mediator has proved popular, but it's also useful for large commercial projects.

With this latest version of EXP, you can access script functions directly from Mediator expressions. For example, you might have written a function to return today's date in a particular format; you can now access that function directly from a Set Property Action to have it displayed.

However, the most useful development is the facility to temporarily disable individual Actions. This makes debugging simpler, as you can now comment out Actions one at a time to narrow down the source of any problems.

For professional multimedia productions, Mediator 8 EXP offers a balance between ease of use (and therefore productivity) and power.

There aren't enough new features in this version to compel users of EXP 7 to upgrade, but this application nevertheless deserves to be in the toolkit of all professional developers creating disc-based multimedia content.

Kevin Partner

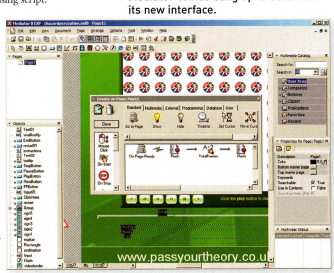
REQUIREMENTS

Windows 98 SE or later.

SUPPLIER

Lako Pacific 1800 657 601
www.lakopacific.com.au

▼ Mediator comes bang up to date with its new interface.



HOT
STUFF
SAMSUNG

lights notebook action

The days of featureless notebooks are over. Adam Turner hunts down the latest entertainment notebooks on the market.

Only a few years ago, rocking up to a LAN party or a movie night with nothing but a notebook under your arm would have made you the laughing stock of your friends. Notebooks were bulky, ugly creatures that sacrificed everything for the sake of portability – leaving you with a glorified typewriter not worthy to calculate the operational parameters of a desk-bound multimedia beast. Heat is the natural enemy of the notebook, but the march of progress has seen designers conquer this and other hurdles to create a breed of powerful notebooks that can more than hold their own in a death match.

A new notebook quickly becomes your constant companion and you use it for work and play. If you're going to be seen with it under your arm, you want passers-by to drool over its sexy bod as well as the grunt that lies within. Sleek designs with splashes of black and silver abound, accompanied by expanses of widescreen real estate.

Dedicated multimedia buttons and high-gloss LCDs are there to appease movie-lovers, while improved screen response times and phenomenal benchmarks are luring gamers away from their boxes.

For this month's roundup we threw down the gauntlet, calling on notebook builders to pit their best 15.4 and 17-inch multimedia beasts against all comers. Many were called, few were chosen. Features abound, from TV tuners and remote controls to built-in webcams – supported by bucket loads of raw grunt – and we tell you which ones are the best investments.

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PIONEER DREAMBOOK POWER 900

PRICE: $4499

LABS VERDICT

Noisy and powerful, but it's the mother of all notebooks.

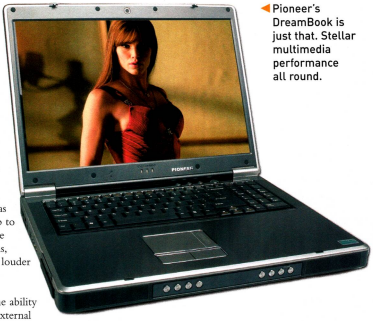
Performance	143	OVERALL
Features	104	118
Value	94	

100 is the average

The Pioneer DreamBook Power 900 is a locally built monster – this isn't a desktop replacement, it's a desk. It sports serial, parallel and PS/2 ports along with the only DVI output in the roundup. It also has a single analog TV tuner, but no antenna, letting you record from TV.

On the test bench it went off like a frog in a sock thanks to the most powerful processor and graphics card in the line-up. It is the only notebook to run Doom3 at the highest quality by default. It is also the only one to run Windows XP Media Center but, aside from PowerDVD, there's little extra software to speak of. A digital clock readout accompanies the multimedia and volume buttons on the front of the unit, but unfortunately the full size remote control can't be hidden even within this enormous chassis. The 1680 x 1050 display does a fine job with DVD playback, but isn't quite up to the gaming speeds this monster can generate. The rich sound from the HD audio has to be cranked up to be heard over the whine of the fans, which gets even louder when you run multimedia.

Along with the ability to record from external sources, the Pioneer can sport a built-in webcam (missing in our review model) and even face recognition software to bar unwanted users and email you their mugshot.



Pioneer's DreamBook is just that. Stellar multimedia performance all round.

Thanks to the benchmarks, the Pioneer blew away the competition to win this roundup. If you can stand the noise and weight, this is a true high performance, multimedia beast.

ASUS W2P00VC

PRICE: $4999

LABS VERDICT

Big, black and beautiful, this notebook is one with the lot.

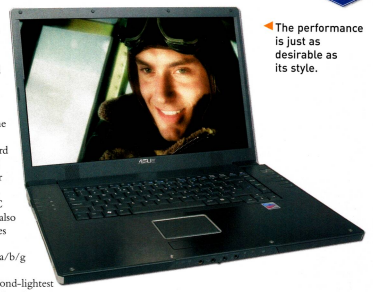
Performance	116	OVERALL
Features	105	102
Value	75	

100 is the average

We dubbed the ASUS 'The Black Box' because, like its aeronautical namesake, it records everything. This is one of the sexiest notebooks of the bunch, with magnets instead of a screen latch helping it keep its slimline figure. Under the bonnet, nestled alongside the fastest Pentium-M processor in the roundup, is a dual analog/digital TV tuner.

Using ASUS's Mobile Theatre, with a gunmetal back drop that looks dead sexy on this black beast, you can watch one program while recording another, or capture analogue or digital video input. Quadraphonic speakers (and a subwoofer underneath) produce one of the richest sounds of the roundup but, if they still don't float your boat, you can use the digital or 5.1 channel analogue audio outputs. A slimline remote control, that slots inside the unit like a PC card, also helped to make this one of the few notebooks tested to attain true 'multimedia beast' status. Unfortunately the remote lives in the actual PC card slot, so you need to find it another home when you want to use a PC Card. ASUS has also thrown in features such as gigabit Ethernet, 802.11a/b/g and Bluetooth.

This is the second-lightest 17-inch model, after the lightweight Samsung. Features-wise, the ASUS is a class above the HP and Toshiba, except for a slightly lower gaming benchmark and the poor screen. At these prices it's a shame its 1680 x 1050 LCD is the least capable at displaying the highest and lowest colour shades. Despite the steep price tag, this is a true lightweight multimedia beast and our 17-inch notebook of choice. It also takes home our Recommended Award for this roundup, because there isn't another notebook on offer that manages to pack this kind of performance and amount of features into such a slim, stylish package.



The performance is just as desirable as its style.

ACER ASPIRE 1692 WLMI

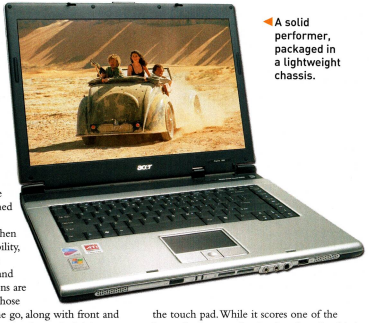
PRICE: $2499

LABS VERDICT

A powerful notebook that won't break your back, or your budget.

Performance	113	OVERALL
Features	85	109
Value	135	

100 is the average



A solid performer, packaged in a lightweight chassis.

The Acer Aspire 1692 WLMi is a story of compromises; a +/-/RAM dual layer burner and gigabit Ethernet are offset by Windows XP Home, only 512MB of RAM and the slowest processor and hard disk of the bunch. An ATI Mobility RADEON X700 sees it punch above its weight in the gaming benchmarks, combining with a low price tag to earn the perhaps undeserved title of best 15.4-inch notebook in this roundup. It has a poor display for gaming and, while the high gloss display offers good colour contrast and is well suited to watching movies, Acer's multimedia suite offers disappointing DVD playback. The speakers are also quite poor compared to the competition. All this would suggest the Mobility RADEON X700, even with only 128MB of video memory, is overkill for this notebook.

Dropping the graphics card down a model and knocking a few dollars off the already competitive price would make this unit better value for money for those not too concerned about gaming performance. When it comes to usability, infrared and the external Wi-Fi and Bluetooth buttons are very useful for those constantly on the go, along with front and side USB ports and a slot optical drive – eliminating the chance of accidentally snapping off the 'coffee cup holder' CD tray. We are particularly taken by the extremely useful four-way scroll button located under the touch pad. While it scores one of the lowest business application benchmarks, this is against some stiff competition and the Acer is no slouch. If you're looking for a value work notebook that will entertain you once in a while, the Acer is certainly worth considering.

DELL INSPIRON 6000

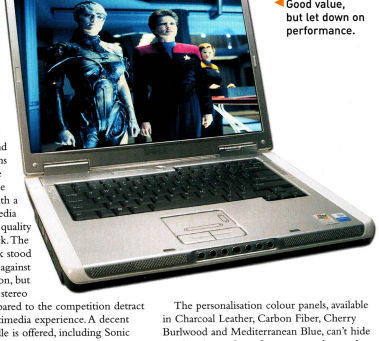
PRICE: $2898

LABS VERDICT

Strong video playback, but seriously underpowered.

Performance	81	OVERALL
Features	97	92
Value	105	

100 is the average



Good value, but let down on performance.

The Dell Inspiron 6000 walks into this roundup with a serious disadvantage – packing only an Intel P-M 1.86GHz and an ATI Mobility RADEON X300 it is easily outgunned by the competition. Dell offers faster processors in the Inspiron range, but sadly the X300 is as good as it gets. The Inspiron 6000's above average 15.4 widescreen display offers 1920 x 1200 native resolution, beating even its 17-inch competitors.

It deserves a more powerful graphics engine, which lets down the side with a poor gaming benchmark. Had Dell blessed it with an X700, the Inspiron 6000 probably would pip the Acer to take out best 15.4-inch notebook, even with the price difference.

Feature-wise the Dell has a few bells and whistles to lure in business users, with 802.11a, Bluetooth and horizontal and vertical scroll built into the trackpad. Unfortunately it is let down by a lack of gigabit Ethernet and a limited memory card reader. Backlit multimedia and volume buttons are a welcome sight for movie buffs along with a CyberLink media suite for high quality media playback. The DVD playback stood up quite well against the competition, but disappointing stereo speakers compared to the competition detract from the multimedia experience. A decent software bundle is offered, including Sonic MyDVD, RecordNow and the excellent PowerDVD. This is reasonably priced for 15.4-inch notebook, having recently dropped $300.

The personalisation colour panels, available in Charcoal Leather, Carbon Fiber, Cherry Burlwood and Mediterranean Blue, can't hide the fact those after a faster power plant and beefier graphics will find more suitable models elsewhere in this roundup.

HP PAVILION ZD8001AP

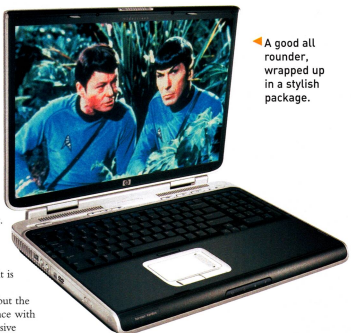
PRICE: $3199

LABS VERDICT

A beautiful balance between price, performance and features.

Performance	98	OVERALL
Features	96	
Value	103	99

100 is the average



A good all rounder, wrapped up in a stylish package.

You really have to look to the 17-inch giants like the HP Pavilion zd8001AP to find machines that were designed as multimedia beasts from the ground up. The HP's sharp, bright display came in second and is well suited to both DVD playback and gaming. Under the bonnet, HP has strived to focus on multimedia rather than business needs – using Windows XP Home and forgoing gigabit Ethernet and 802.11a for the only 16MB cache hard disk of the roundup and a set of Harman Kardon speakers – a name synonymous with audio quality.

The inclusion of iTunes, WinDVD and Nero also shows an entertainment focus and offers good value.

Considering all this we were surprised at the lack of multimedia buttons, but all was forgiven once we stumbled across the tiny remote control which tucks away neatly in the unit like a PC card. The Pavilion also has a handy combination Wi-Fi/Bluetooth button for killing all the wireless connections when the need calls for it. Giving this beast a measly 512MB of RAM seems an unforgivable sin – it is available in higher Pavilion models – but the zd8001AP keeps pace with the far more expensive Toshiba, which has double.

Were there 1GB under the bonnet this unit would have snuck in front of the Toshiba on points before you even allow for the likelihood of higher benchmarks. It also tips the scales at over 4kg, but its performance makes it worth lugging about the extra weight. This is the 17-inch notebook of choice for those who don't insist on blistering 3D gaming speeds or a TV tuner.

NEC VERSA M540

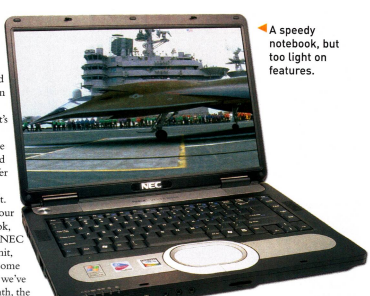
PRICE: $2999

LABS VERDICT

A powerful processor, but little in the way of added features.

Performance	87	OVERALL
Features	93	
Value	102	93

100 is the average



A speedy notebook, but too light on features.

The NEC Versa M540 is a mixed bag, with middle of the road benchmarks and a high gloss display well suited to watching movies, but not the best for gaming. Despite the Pentium-M 2GHz processor under the bonnet, there are few real standout features that put this ahead of the pack. And this probably isn't helped by the fact the processor is accompanied by the older Intel 855GME chipset – most of the units in this roundup are built around the Intel 915PM chipset, which supports PCI Express.

There's no sign of Bluetooth, Gigabit Ethernet, infrared, 802.11a or a Wi-Fi button. Likewise on the entertainment front, there are no multimedia buttons, volume buttons or anything else to really grab the entertainment crowd.

There is one thing that this notebook offers, however, that shows it's intended to stand apart from a standard notebook and that's the high gloss display and, despite the ordinary sound quality, a subwoofer speaker on the bottom of the unit.

Compared to your every day notebook, this does cast this NEC as a multimedia unit, but compared to some of the behemoths we've reviewed this month, the Versa M540 doesn't stand out from the bunch. Digging through the box we were impressed to find a Windows XP Pro installation disc – something you don't always get from multi-national vendors – and very handy if you're fond of rebuilding your computers every now and then. Overall, this notebook demands a premium for the speedy Pentium M 2GHz processor, but it doesn't follow up on the features-front.

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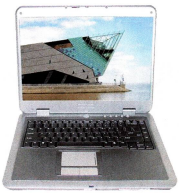

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OMEGA VIEWMASTER PORTIVA 5Z71

PRICE: $2899

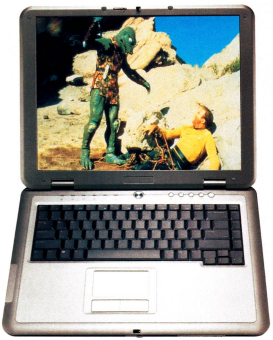
LABS VERDICT

Well suited to watching DVDs at the end of a day's work.

Performance	97	OVERALL
Features	112	
Value	122	108

100 is the average

▶ Huge features and a low price make this a bargain.



The Omega Viewmaster Portiva 5Z71 is another notebook comprising of trade-offs; the blistering Pentium-M 2GHz processor offset by an NVIDIA GeForce Go660 graphics card with only 64MB of video memory, accompanied by the smallest hard drive of the bunch. This isn't helped by a mediocre gaming benchmark – it was one of only two to run Doom 3 at the lowest setting by default. Even so, excellent contrast and colour reproduction sees this notebook ace the DVD playback tests – the picture is sharp and clean and we can see the darkest colour shades which were invisible on every other notebook.

HD audio with a digital audio output, along with front multimedia buttons, also serve it well in the entertainment stakes.

When it comes to work, the locally built Omega is one of the lightest notebooks in this roundup and also returned respectable work application benchmarks. The touchpad is blessed with vertical but no horizontal scroll and unfortunately four of the generous five USB ports are located on the back. Local system builders have a reputation for quickly incorporating new technologies and Omega has continued this by offering one of the new PC Card Express expansion slots, the new PCMCIA standard which will enable users to move modules between desktop and notebook computers (see www.expresscard.org).

The Omega also comes with one of the most substantial software suites on offer, including Microsoft WorksSuite, Word, Money and Encarta. Unless you are drawn in by the Acer's speedy gaming benchmarks, the lightweight Omega would be the 15.4-inch notebook of choice.

PROTAC EXCEL D495

PRICE: $3399

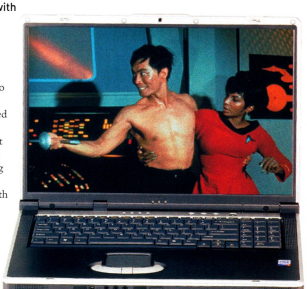
LABS VERDICT

Big and bold, it lacks gaming grunt and a few handy features.

Performance	92	OVERALL
Features	99	
Value	95	95

100 is the average

▶ An average all rounder with a neat software bundle.



Like the Pioneer, the Protac Excel D495 is another locally built giant – at this size we're wading into desktop replacement territory. Not surprisingly, it comes equipped with gigabit Ethernet plus serial, parallel and PS/2 ports and an external Wi-Fi button. Unfortunately, all the USB ports are on the back, breaking the somewhat recent convention of placing them down the side.

It sports a single analog TV tuner, so you can record programs to the generous hard disk, but without a second tuner you won't be watching another program at the same time. You can also record from external S-Video, DVI sources or the built-in webcam and microphone. The Protac ships with a full-sized remote control, which you can't tuck it away in the unit, so we would have appreciated some multimedia buttons and a volume control. An external antenna would also be useful, rather than just the connection. We are disappointed not to find a PCI Express graphics card under the bonnet with the P4 processor, and this is reflected in mediocre gaming benchmarks.

We are also disappointed with the sound, the optional subwoofer would certainly help, and it was one of the noisier units of the roundup. The 1440 x 900 display does a good, but not outstanding, job of handling video playback and gaming.

When it comes to software, Windows XP Pro is accompanied by a solid range of multimedia apps. As a multimedia centre the Protac has plenty to offer but is missing a few features. It is still the closest thing we found to a multimedia beast with TV tuner this side of $4000. Put it on your short list if you've got a strong back and don't have a fortune to spend.

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SAMSUNG M40 PLUS

PRICE: $3599

LABS VERDICT

A pricey unit which can't compete with the others on test.

Performance	73	OVERALL
Features	99	84
Value	81	

100 is the average

The Samsung M40 plus is a slick and stylish notebook, but unfortunately just doesn't cut it compared to the others on test here. Despite packing an ATI Mobility RADEON 9700 under the bonnet, the Samsung is one of only two units to run Doom 3 in low quality mode by default. The relatively low gaming benchmark result is due to the average components under the hood, with 512MB of RAM, 64MB of video memory, a 17-inch widescreen display, and the second slowest processor of the bunch.

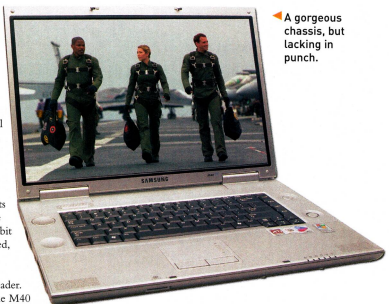
On the flipside, the M40 plus certainly has some style – it's the lightest and thinnest of the 17-inch notebooks we tested. Samsung has clearly tried to be innovative with its design by using a large, four-way button for hot key access rather than the standard row of buttons above the keyboard. However, we would have liked to have seen some multimedia keys, as well as some external volume control.

It also unfortunately lacks some of the features of the cheaper units on test here like Bluetooth, Gigabit Ethernet, infrared, 802.11a and a multi-format memory card reader.

Ultimately, the M40 is a very stylish, ultra-thin, ultra-light 17-inch notebook, but unfortunately it appears to sacrifice too many features for the style.

Combined with the relatively high price tag, and despite the ATI Mobility RADEON 9700, the Samsung simply doesn't provide the best bang for your hard earned buck.

For those looking for style and substance, the HP or ASUS cram more in for less so be sure to check them out as well.



◀ A gorgeous chassis, but lacking in punch.

TOSHIBA SATELLITE P30

PRICE: $3999

LABS VERDICT

The exquisite display is let down by an average graphics card.

Performance	100	OVERALL
Features	107	99
Value	88	

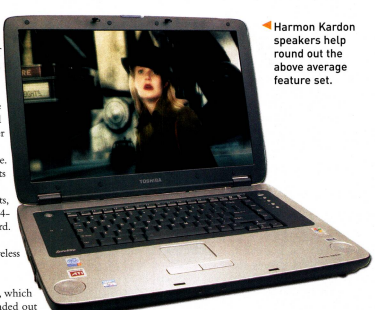
100 is the average

The Toshiba Satellite P30 is a 17-inch behemoth with a price tag to match. It has an exquisite 1440 x 900 screen, easily beating all comers, and is well suited to movies and gaming – if gamers can overcome the glare found on the new generation of high gloss LCD screens. It was one of the brightest tested and was the best for showing the lightest and darkest colour shades.

Complementing such an beautiful display is a set of Harman Kardon speakers. Considering this, we were extremely disappointed to find an external volume dial but no multimedia buttons, remote control or digital line out. The phenomenal work application benchmarks are thanks to a desktop 3.6GHz Intel Pentium 4 processor under the bonnet – equal fastest in the roundup. You pay for this grunt, not just in cash, but with grunting of your own thanks to the unit's backbreaking weight, but none of the P4's tested weighed in under 4kg – and some weighed far more.

The unit sports PC card and PC Card Express slots, as well as a neat 4-in-1 memory card. Strangely the 801.11a/b/g wireless card isn't accompanied by gigabit Ethernet, which would have rounded out its connectivity options.

Gamers will be disappointed with the benchmarks, but Toshiba have only blessed this unit with an ATI Mobility RADEON X600. Had they have thrown in an X800, or perhaps even a X700, this notebook would have romped it in to win the roundup – but then the same could be said for the far cheaper HP which has more features. Ultimately, while this loses out on value for money, the Toshiba is easily one of the beautiful units on test.



◀ Harmon Kardon speakers help round out the above average feature set.

APPLE POWERBOOK G4

PRICE: $4299

LABS VERDICT

The best of absolutely everything, if you think you can survive without Windows.

Apple's 17-inch PowerBook G4 is a thing of beauty, shaming the other 17-inch notebooks with its size, weight and design – perhaps with the exception of the ASUS. Comparing apples and oranges is tricky, and we don't think of the 1.67GHz processor in PC terms – this puppy has some serious grunt and packs 512MB of RAM and a 128MB ATI Mobility RADEON 9700. Also under the bonnet is a generous 100GB hard drive. The DVI and S-Video outputs are accompanied by a microphone and digital audio line-in/out, but the rich onboard sound can't quite match the bass clarity of the ASUS and Pioneer.

The 1440 x 900 display is up to Apple's high standard, with excellent DVD playback. Unfortunately, nice touches such as the backlit keyboard aren't accompanied by multimedia buttons. Nor are you going to find built-in TV tuners or webcams. For work hours, the PowerBook sports an 8x DVD burner, gigabit Ethernet, 802.11b/g, Firewire 800, Bluetooth 2.0 and a Type I/II PC Card slot. Software is always a strong point when it comes to Macs and this includes iLife (which bundles iTunes, iPhoto, iMovie HD, GarageBand and iDVD) and the new OS X 10.4 Tiger operating system.

One of the PowerBook's key strengths is that the software and hardware are designed with each other in mind, so everything works seamlessly in a way Microsoft users are just beginning to experience.

If you can live without Microsoft Windows and handle the relatively hefty price tag, the PowerBook's combination of size, performance, price and useability could make it your multimedia beast of choice.

▲ Few notebooks, barring the ASUS and Samsung models, match the design and style of the PowerBook.

ON THE PERIPHERARY

Once you've sold a kidney to buy your ultimate multimedia beast, you need the matching ultimate peripherals.

Protect your precious purchase with a carry case – look to a companies like Targus, Dicota, Crumpler and STM for either a briefcase, back pack or rolling travel bag with a truck load of pockets.

If you have a trackpad phobia you'll want to invest in a mini-mouse – try Targus, Microsoft or Belkin to name a few.

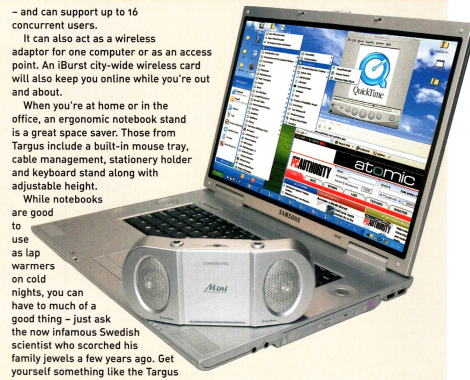
'An iBurst city-wide wireless card will also keep you online while you're out and about. '

If you're serious about your LAN, setting up a wireless gaming session on the fly is going to impress. 3Com's Office Connect 54Mb/s 11g Travel Router is small enough to sit on your hand and, along with the power supply, fits in a soft carry case small enough to slip into a briefcase or hand luggage. It acts as a DHCP server – with a stateful packet inspection (SPI) firewall and Wi-Fi Protected Access (WPA) – and can support up to 16 concurrent users.

It can also act as a wireless adaptor for one computer or as an access point. An iBurst city-wide wireless card will also keep you online while you're out and about.

When you're at home or in the office, an ergonomic notebook stand is a great space saver. Those from Targus include a built-in mouse tray, cable management, stationery holder and keyboard stand along with adjustable height.

While notebooks are good to use as lap warmers on cold nights, you can have to much of a good thing – just ask the now infamous Swedish scientist who scorched his family jewels a few years ago. Get yourself something like the Targus Coolpad to provide a solid and rigid work space while protecting your valuables.



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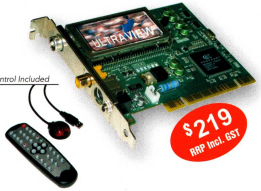

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Beat the salesman

At some point, you'll need to head to a store or jump online before you buy a notebook. Adam Turner dispenses some indispensable advice.

When you're looking to buy a notebook, the first question to ask is: why a notebook? Sounds obvious, but you get a lot more bang for you buck from a desktop rig so don't waste money on something that will stay chained to your desk. With that big decision out of the way, think about what you're going to do with your new-found portable marvel. Gaming? Movies? Word processing? Each type of activity will greatly affect your choice of notebook, even more so than a desktop PC.

Answer these questions and you're less likely to be suckered by a salesman. Before you even leave the house hit Google. Check out reviews, compare prices, get a feel for what's around. A trip through your *PC Authority* archive will also set you straight, giving you a good indication of appropriate price points.

'Style, build quality and design are crucial intangibles that you can't overlook.'

Notebooks are a balancing act between size, performance, features, battery life and price – change one, and something else has to give. Figure out which is most important to you, lock it in, and work from there. Performance is king if you're after a portable gaming or entertainment rig, both under the bonnet and the quality of the screen and features should guide your decisions if you're looking for a work machine. Don't forget that there's a reason why desktop replacements are so named: portability and battery life take a huge tumble with bigger 'books.

NUTS AND BOLTS

Unlike your desktop box, notebooks have limited upgrade potential so choose wisely and plan for the future. After price, screen real estate is your number one concern so lock it in early. Do you want a 10-inch display for writing the great Australian novel on the bus or a 17-inch monster for fragging all challengers?

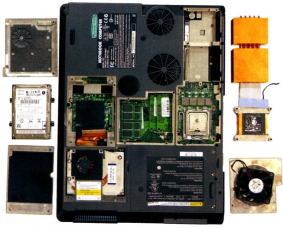
Under the bonnet, you'll want the fastest processor you can afford, but don't pay a premium for a cutting edge power house when the next model down will handle your occasional letter writing with ease. A mobile processor, such as the Pentium M range, with the latest chipset should give you a lighter notebook with better battery life than a desktop processor. Steer clear of a Pentium 4 crammed into a notebook unless you need pure, unadulterated grunt and are prepared to lug about a 4kg+ beast and its power supply. Whatever the processor, make sure it's got at least 512MB of RAM to play with – 1GB if you've got multimedia tendencies.

One of the more difficult decisions is the graphics card, after screen size it's the easiest way to waste money or sell yourself short.

PCI Express offers better performance and for gamers the decision is simple, hock your grand mother and get the best you can afford. Everyone else should go middle of the road, something that will at least handle DVD playback. By now you should have narrowed down your options so it's time to compare features.

The bigger the hard disk the better, insist on a 5400rpm drive if you're running anything more than basic Office applications. A DVD burner is essential, 8x +/-RW if you can manage it, whether it's for backing up important documents or burning home movies. The exception is if you're trying to shed some weight, in which case high speed wireless and a chunky USB memory stick should allow you to leave the optical drive at home.

▼ Some notebooks offer extensive upgrade potential, similar to a desktop.



ICING

With the main components out of the way, you'll need to turn yourself to all the trimmings that can suspiciously bump up the cost if you're not watching. Do you need 802.11g, Bluetooth, gigabit Ethernet and a docking station? How about a built-in webcam, TV tuner and quadraphonic sound? Work out your priorities, write them down even, and the choice will become clear. Also, don't be afraid to play hard to get and make them to throw in a few accessories to sweeten the deal. Aim for a spare battery or a sturdy carry case with plenty of padding and pockets.

Finally, always consider the mysterious X factor: quality. This could be something as simple as typing a sentence on the keyboard to feel the action, or it could be running your hands along the chassis to ensure everything fits smoothly together. Either way, style, build quality and design are crucial intangibles that you can't overlook.

STAY IN TUNE

If your notebook isn't blessed with a TV tuner, there's still hope for transforming it into a complete multimedia beast. You can always slip an analogue or digital TV tuner card in the PC card slot, turning it into a television so you can watch re-runs of The Simpsons wherever you go.

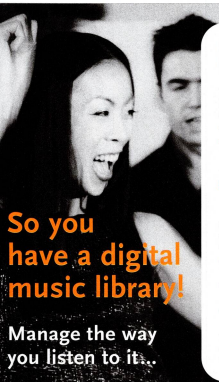
'Turn your notebook into a full blown personal video recorder.'

AverMedia's AVerTV Cardbus, PCMCIA TV Tuner Card will set you back about $100, then all you need to do is hook it up to an antenna. The AVerTV will turn your notebook into a full blown personal video recorder, with 16 channel preview, a scheduler for recording your favourite shows, and the ability to time shift.

It incorporates an MPEG II software decoder and will also let you watch video feed from an external video device like VCR or camcorder through composite or S-Video connection. More expensive models also include an FM radio.

The LifeView FlyDVB-T Duo Cardbus TV Solution is about $200 and includes analogue and digital TV tuners along with a digital radio tuner. Also requiring an external antenna, it lets you watch two programs at once – plus an A/V input cable lets you connect devices like a VCR, camcorder or game console. Apple Mac owners can try the Elgato EasyWatch Mobile Set DVB-T PC card, but it will set them back about $400 because it comes with an active antenna with built-in amplifier. The EasyWatch lets you watch digital terrestrial TV on a PowerBook, just insert the mini-receiver in the PCMCIA/CardBus slot, clamp the antenna on the display of your PowerBook and enjoy the idiot box where ever you go.

▲USB and PCMCIA TV tuners are a good option for notebooks.



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- Get the best possible sound from your iPod!

Slim Devices Squeezebox2 Wireless Music Player

802.11g wireless won't slow down your wireless network

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- Plug in architecture displays RSS feeds, screensavers, time, alarm clock, etc
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Rip, Listen, Manage, Burn

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Performance Analysis

Multimedia notebooks aren't like your ordinary portables. **Adam Turner** shows you how we found the best of the best.

With so many variables involved, *PC Authority* uses numbers to help us gauge which products are the true performers. Lining up the notebooks side by side, we pushed their processing and graphics capabilities to the limits before comparing their screen qualities and analysing their features. Using a complex set of voodoo mathematics we weighed performance against features and price to separate the roaring multimedia beasts from the not so beastly.

DisplayMate is the benchmark of monitor benchmarks.

'We weighed the power supplies separately – an important figure if you're considering a desktop replacement with a battery life equal to a dancing toy cow.'

BENCHMARKS

We started by putting each notebook through its paces with two performance benchmarks. PCMark04 is an application-based benchmark for measuring overall PC performance by looking at file compression and encryption along with virus scanning, grammar checking, audio conversion, image processing, WMV and DivX video compression, web page rendering and physics calculation and 3D. Next 3DMark05 measured 3D gaming grunt – requiring a DirectX 9.0 compliant graphics card with support for Pixel Shaders 2.0 or higher. We used it to assess graphics grunt using three game tests – Return to Proxycon, Firefly Forest and Canyon Flight – to challenge the notebooks with reflections and refractions, multiple light sources and fine details. We ran both benchmarks three times and took the average, with each figure contributing 40 percent of that notebook's performance score.

DISPLAY QUALITY

The remaining 20 percent of the performance score was based on display quality. It was mostly measured using DisplayMate Multimedia Edition – a benchmark application which produces a series of screen shots allowing you to assess a display's contrast, colour contrast and other variables.

To assess blur for gaming we started off with Doom 3, spinning around in the landing bay while watching boxes and consoles whiz past. Whilst fun, this was less than enlightening and we took a more scientific approach. Australian benchmarking outfit PassMark produce MonitorTest, which includes LCD Pixel Persistence. This consists of five white boxes moving across the screen at five different, but fixed, pixel rates making this an ideal test for spotting blur. We also deducted gaming points for screens using high-gloss (ie high-glare) screens but awarded those screens extra points when assessing DVD playback. Then we measured brightness, using the light meter in a high-end digital camera, and judged the look of the desktop and text on the screen.

FEATURES

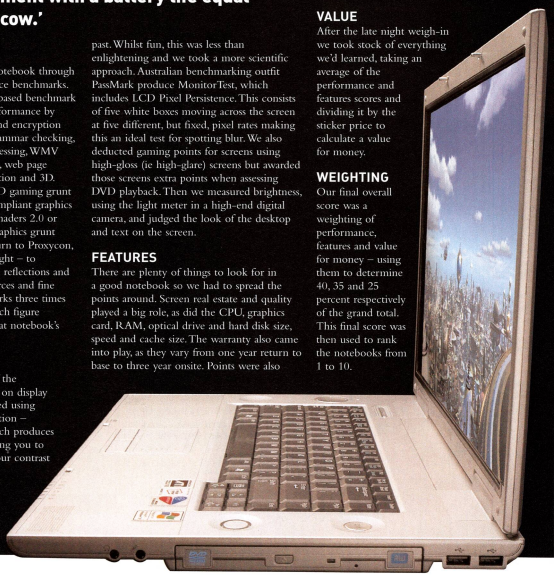
There are plenty of things to look for in a good notebook so we had to spread the points around. Screen real estate and quality played a big role, as did the CPU, graphics card, RAM, optical drive and hard disk size, speed and cache size. The warranty also came into play, as they vary from one year return to base to three year onsite. Points were also awarded according to the features of the keyboard, memory card reader, network card and wireless card. We also took into account the number of USB, Firewire and PC Card ports, as well as the inclusion of a spare battery and bundled software. Vendors can get creative with their weight measurements, strategically leaving bits out, so we took our own measurements. We also weighed the power supplies separately – an important figure if you're considering a desktop replacement with the battery life of a dancing toy cow on Christmas Day.

VALUE

After the late night weigh-in we took stock of everything we'd learned, taking an average of the performance and features scores and dividing it by the sticker price to calculate a value for money.

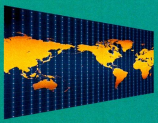
WEIGHTING

Our final overall score was a weighting of performance, features and value for money – using them to determine 40, 35 and 25 percent respectively of the grand total. This final score was then used to rank the notebooks from 1 to 10.

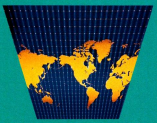


CASIO

Now you can save the world from distortion and blurring with 1 finger.

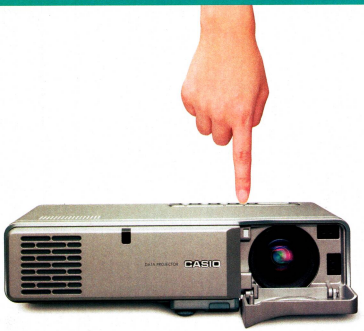


Auto horizontal keystone correction required.

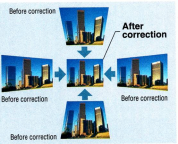


Auto vertical keystone correction required.

Auto focus required.



ONE-TOUCH CORRECTION from CASIO !



DATA PROJECTOR

CASSIOPEIA® PRO

Single-button operation for automatic focus and screen distortion correction

CASSIOPEIA® PRO users can correct image distortions on the screen arising from the projector's positioning and adjust the focus automatically, too, with just one touch. Distortions can be corrected across a wide projector positioning range of ±30°, both vertically and horizontally.

High-Performance Models

XJ-560 3000 ANSI lumens
XJ-460 2500 ANSI lumens

- Automatic vertical/horizontal keystone correction
- Auto focus
- 2X zoom
- DLP™ system installed

Wide-angle 2X zoom, the maximum magnification among data projectors*

The wide-angle 2X zoom lens offers the maximum magnification available in a data projector,* permitting effective projection in smaller or larger presentation rooms.

*As of October 2004 (according to CASIO survey information)

Super-Mobile Model

XJ-360 2200 ANSI lumens

- Ultra-compact size/1.8kg (230 x 55 x 171mm)
- Automatic vertical keystone correction
- 2X zoom
- DLP™ system installed

CASSIOPEIA is a registered trademark of CASIO Computer Co., Ltd. in Japan. DLP is a trademark of Texas Instruments.

FOR FURTHER INFORMATION, PLEASE CONTACT:

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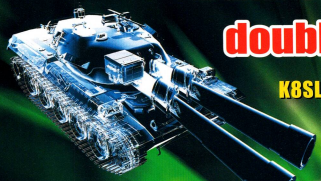


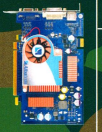
NVIDIA SLI MULTI-GPU READY

PC6600
"HOT"
Atomic
Dec.2004, Australia

K8SLI

Nvidia nForce4 SLI chipset

- Supports Socket 939 AMD Athlon™ 64 / FX Processors
- FSB 1000+ MHz
- Supports Dual Channel DDR 400+ Memory up to 4 GB
- Supports 2 * PCI-Express x 16 (Nvidia SLI Technology Support, x8+x8)
- Supports 4 * ATA133, 4 * Serial ATAII
- Built-in Nvidia 10 / 100 / 1000Base -T LAN with Hardware Firewall
- Built-in 6-Channel Audio (AC'97), S/PDIF
- Supports 8 * USB2.0
- Supports Nvidia RAID 0,1,0+1,SATA+PATA RAID
- ABS (optional)
- Chipset Supports HyperTransport™ Technology
- Supports CooI'n'Quiet
- Jumper Free Design
- Watch Dog Timer



PC6600GT / V

- NVIDIA® GeForce™ 6600GT GPU (Clock 500MHz)
- Superscalar 8-pipe GPU Architecture
- 128 MB, 128-bit DDR 3 Memory
- Innovation PCI Express with D-Sub / TV-Out / DVI ports / (VIVO optional)
- CineFX™ 3.0 engine supports Microsoft® DirectX® 9.0c Shader Model 3.0
- Supports Intellisample™ 3.0, UltraShadow™ II, HPDR, Digital Vibrance Control™ 3.0 multi-display technologies
- Supports SLI technologies
- Bundled DVD Player software and PC games

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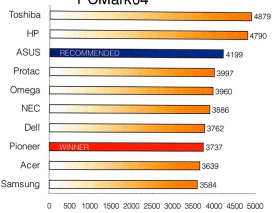
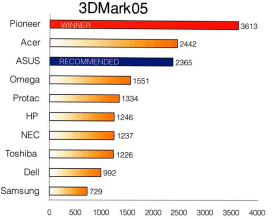
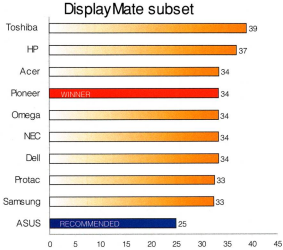
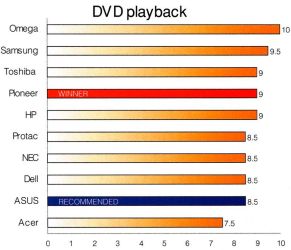
Benchmark

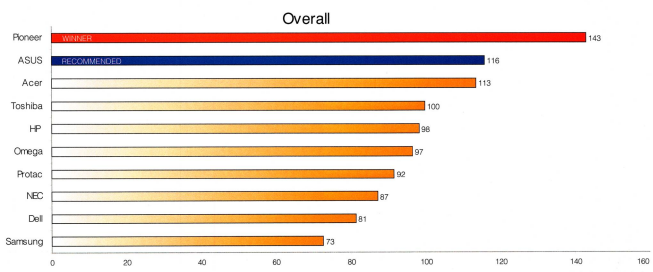
We ran each notebook through a battery of tests. Here's a rundown on how they scored.











Labs Issue 93	Acer Aspire 1692 WLMi	ASUS W2P00VC	Dell Inspiron 6000	HP Pavilion zd8001AP	NEC Versa M540
Price (inc GST)	$2499	$4999	$2898	$3199	$2999
Supplier	Acer	ASUS	Dell	HP	NEC Computers Australia
Phone	1300 566 367	1300 278 788	13 33 55	13 13 47	(02) 9313 0000
Internet	www.acer.com.au	www.asuscom.au	www.dell.com.au	www.hp.com.au	www.nec-online.com.au
Warranty	1 yr RTB	2 yrs pickup and return	1 yr pickup and return	1 yr RTB	1 yr RTB
Processor	Intel P-M 1.73GHz	Intel P-M 2.13GHz	Intel P-M 1.86GHz	Intel P4 3.2 GHz	Intel P-M 2GHz
Chipset	Intel 915PM	Intel 915PM	Intel 915PM	Intel 915PM	Intel 855GME
Amount of RAM	512MB	1GB	1GB	512MB	1GB
BIOS type	Acer	ASUS	Dell	HP	Insyde
Carry case supplied	No	No	No	No	No
Battery technology	Li-Ion	Li-Ion	Li-Ion	Li-Ion	Li-Ion
Spare battery	No	No	No	No	No
Display					
Technology	TFT LCD (CrystalBrite)	TFT LCD (Glare Type)	TFT LCD	TFT LCD (BrightView)	TFT LCD (Super Shine View)
Screen size	15.4in widescreen	17in widescreen	15.4in widescreen	17in widescreen	15.4in widescreen
Graphics chipset / Video RAM	ATI Mobility RADEON X700	ATI Mobility RADEON X700	ATI Mobility RADEON X300	ATI Mobility RADEON X600	ATI Mobility RADEON 9700
Video RAM	128MB	256MB	128MB	128MB	128MB
Native screen resolution; colours	1280 x 800; 16m	1680 x 1050; 16m	1920 x 1200; 16m	1440 x 900; 16m	1280 x 800; 16m
Storage					
Hard disk (unformatted size/speed)	80GB/4200rpm	80GB/5400rpm	80GB/5400rpm	80GB/5400rpm	80GB/5400rpm
CD/DVD-ROM (W x RW x R)	8x4x24 +/-/RAM/DL	8x4x24 +/-/RAM/DL	8x4x24 +/-/DL	8x4x40 +/-/DL	8x4x24 +/-/DL
Floppy disk	No	No	No	No	No
Peripherals					
Sound chipset	Conexant AMC Audio	Realtek HD Audio	Sigmatel C-Major audio	Conexant AMC Audio	Realtek AC 97
Internal speakers	Stereo (Narrow)	Quadraphonic	Stereo (Wide)	Stereo (Wide)	Stereo (Wide) + subwoofer
Modem	56K v.92	56K v.92	56K v.92	56K v.92	56K v.90
Network	10/100/1000	10/100/1000	10/100	10/100	10/100
802.11a/b/g	802.11b/g	802.11a/b/g	802.11a/b/g	802.11b/g	802.11b/g
Other	Bluetooth; built-in mic; Wi-Fi button; Bluetooth button	Bluetooth; TV tuner; remote control	Bluetooth; multimedia buttons	Bluetooth; combination Wi-Fi button; Bluetooth button; volume buttons; HP USB Digital Drive; remote control	Built-in mic
PC card slots					
Number and type	1 x Type II	1 x Type II	1 x Type I/II	1 x Type II; 1 x Express	1 x Type II
Cardbus support	Yes	Yes	Yes	Yes	Yes
Ports					
Serial	0	0	0	0	0
Parallel	0	0	0	0	0
VGA	1	1	1	1	1
Infrared	1	0	0	0	0
USB 2.0	3	3	4	4	3
IEEE1394	1	1	1	1	1
PS/2	0	0	0	0	0
Other ports	Headphone; mic; line-in; digital line-out; S-Video out; MS/MS Pro/MMC/SD reader	AV line-in; MMC/SD/MS Pro slot	Headphone; mic; S-Video out; SD/SDIO slot	Headphone; mic; S-Video out; SD/MS/MS Pro/MMC/SM/xD reader	Headphone; mic; line-in; line-out; S-Video out; SD/MMC/MS/ Smart Card reader
Docking station port	No	No	Yes	Yes	No
Software					
Operating system	Windows XP Home	Windows XP Pro	Windows XP Pro	Windows XP Home	Windows XP Pro
Main titles supplied	CyberLink PowerProducer Gold; Norton AV 2004; NTI Backup NOW 3; NTI CD & DVD-Maker 6.5	ASUS Mobile Theater; ASUSDVD XP 5.0; Power Director V3.0 DE; MediaShow V2.0 SE; Nero; PowerDVD; Ulead InstaMedia	PowerDVD; Sonic MyDVD 5.3 LE; RecordNow 7.3 LE; Norton AV (90 days)	WinDVD; Microsoft Works/ Money/Encarta; Norton AV 2005 (60 days); RecordNow	PowerCinema; RecordNow
Size - W x D x H (mm)	360 x 279 x 38.9	395 x 286 x 32.5	356 x 265.5 x 38.7	398.8 x 288 x 49.8	355 x 250 x 30
Weight (inc battery) and power supply	3035g and 395g	3385g and 630g	3335g and 415g	4250g and 1210g	2860g and 360g

Labs Issue 93	Omega Viewmaster Portina SZ71	Pioneer DreamBook Power 900	Protac Excel D495	Samsung M40 plus	Toshiba Satellite P30
Price (inc GST)	$2899	$4499	$3399	$3599	$3999
Supplier	Omega Technology	Pioneer Computers Australia	Protac	Samsung	Toshiba
Phone	(03) 9879 1828	(02) 9690 2888	(02) 8748 8888	1300 369 600	13 30 70
Internet	www.omega.com.au	www.pioneercomputers.com.au	www.protac.com.au	www.samsung.com/au	www.isd.toshiba.com.au
Warranty	2 yrs on-site	1 yr on site; 2-3 yrs on site optional	1 yr RTB	3 yrs next business day onsite	1 yr pickup and return
Processor	Intel P-M 760 2.0GHz	Intel P4 3.6 GHz	Intel P4 3.2 GHz	Intel P-M 1.8GHz	Intel 4 3.6GHz
Chipset	Intel 915PM	Intel 915PM	SiS 648FX	Intel 855PM	Intel 915PM
Amount of RAM	1GB	1GB	1GB	512MB	1GB
BIOS type	American Megatrends	Phoenix	Phoenix	Phoenix	Phoenix
Carry case supplied	Yes	Yes	Yes	No	No
Battery technology	Li-Ion	Li-Ion	Li-Ion	Li-Ion	Li-Ion
Spare battery	No	No	No	No	No
Display					
Technology	TFT LCD (high gloss)	TFT LCD	TFT LCD	TFT LCD	TFT LCD (TruBrite)
Screen size	15.4in widescreen	17in widescreen	17in widescreen	17in widescreen	17in widescreen
Graphics chipset / Video RAM	NVIDIA Go6600	ATI Mobility RADEON X800	ATI Mobility RADEON 9700	ATI Mobility RADEON 9700	ATI Mobility RADEON X600
Video RAM	64MB	256MB	128MB	64MB	128MB
Native screen resolution; colours	1280 x 800; 16m	1680 x 1050; 16m	1440 x 900; 16m	1440 x 900; 262,144	1440 x 900; 16m
Storage					
Hard disk (unformatted size/speed)	60GB/5400rpm	120GB (Promise 2+0 Stripe/ RAID0 SCSI)	100GB/4200rpm	80GB/5400rpm	80GB/5400rpm
CD/DVD-ROM (W x RW x R)	8x8x24 +/-/DL	8x8x24 +/-/DL	8x8x24 +/-/DL	8x4x24 +/-/RAM/DL	8x8x24 +/-/RAM/DL
Floppy disk	No	No	No	No	No
Peripherals					
Sound chipset	Realtek HD Audio	Realtek HD Audio	Realtek AC 97	Crystal WDM Audio	Realtek AC 97
Internal speakers	Stereo (Wide)	Stereo (Wide)	Stereo (Wide)	Stereo (Wide)	Stereo (Wide)
Modem	56K v.92	56K v.90	56K v.90	56K v.92	56K v.90
Network	10/100/1000	10/100/1000	10/100/1000	10/100	10/100
802.11a/b/g	802.11b/g	802.11b/g	802.11b/g	802.11b/g	802.11a/b/g
Other	Built-in mic; Wi-Fi button; multimedia buttons; volume controls	Built-in mic; multimedia buttons; volume buttons; TV tuner; remote control; built-in webcam	Built-in mic; remote control; built-in webcam; TV tuner; Wi-Fi button	Wi-Fi button	Wi-Fi button; volume control
PC card slots					
Number and type	1 x Type II; 1 x Express	1 x Type II	1 x Type II	1 x Type II	1 x Type II; 1 x Express
Cardbus support	Yes	Yes	Yes	Yes	Yes
Ports					
Serial	0	1	1	0	0
Parallel	0	1	1	0	0
VGA	1	1	1	1	1
Infrared	0	1	1	0	0
USB 2.0	5	4	2	3	3
IEEE1394	1	2	1	1	1
PS/2	0	1	1	0	0
Other ports	Line-out; digital line-out; mic; MMC/SD/MS reader	Headphone; mic; line-in; S-Video out/in; digital audio out; composite in; aerial in; CF/SM/SD/MMC/MS/ MS Pro/MicroDrive reader	Headphone; mic; line-in; digital line-out; S-Video in/out; aerial in; CF/SM/SD/MMC/MS/MS Pro/ MicroDrive reader	Headphone; mic; digital audio out; MS Pro reader	Headphone; mic; S-Video out; SD/ MMC/MS/MS Pro/xD reader
Docking station port	No	No	No	No	No
Software					
Operating system	Windows XP Pro	Windows XP Media Center	Windows XP Pro	Windows XP Pro	Windows XP Pro
Main titles supplied	MS Money; MS Word; Streets and Tips; Encarta; MS Works; Picture IT (MS Worksuite package); Norton AV 2005; Power DVD; Nero Burning ROM; Guardian Anti-Theft; Powerdirector DE; Mediashow SE; Need for Speed Underground 2	PowerDVD	WinDVD 4; Roxio Easy Media Creator; Nero and AverTV Studio	PowerDVD; Norton Anti-Virus 2004; Nero; Ulead Video Studio 7.0 SE DVD; Ulead Photo Explorer 7.0 SE Platinum	Microsoft OneNote 2003; Record Now! Basic for TOSHIBA; Intervideo WinDVD; Intervideo WinDVD Creator 2 Platinum; Norton AV 2005 (90 days)
Size - W x D x H (mm)	354 x 272 x 37	397 x 298 x 49.5	329 x 275 x 36.5	395 x 276.5 x 32.6	419 x 293 x 47
Weight (inc battery) and power supply	2965g and 430g	5660g and 1210g	4300g and 1075g	3030g and 400g	4240g and 905g

HARD DISK PLAYERS

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WIRED FOR SOUND

Before you buy, make sure you've covered all the bases – choosing the wrong player could severely limit your enjoyment. We round up the latest models.

Buying an MP3 player is no longer just about the hardware. Your choice could inadvertently tie you into a system: a combination of the player itself, the software in the box and the online stores that it's compatible with (when they launch in Australia – come on Apple!). If you're thinking of making that purchase, you need to know all the facts – that's what we provide in this comprehensive test of players and online services.

One fact you'll soon discover is that the way players handle music has changed. Before, most people's music libraries were haphazard disasters with poorly named music files, often with few, if any, accompanying ID3 tags (the hidden attributes that tell a music player things like what album the song is from and who made it). Instead, tracks would be dumped and sorted in various Windows folders.

Now, thanks to improvements in library managers such as Windows Media Player, iTunes and Napster, filling in missing tags has become largely automated and requires significantly less effort. So, whereas a year ago we leant towards players that were primarily organised using Windows folders (where tracks appear on your player as they do on your PC), this month we favour players that organise files with tags.

However, another problem has reared its head for MP3 fans. Digital Rights Management (DRM) has started throwing several spanners in the works. People who follow the record companies' advice are no longer downloading files illegally and are instead buying them from online music stores only to find they're not compatible with their player, or that they're not free to use their purchases as they want – even though they've paid for them. In fact, something of a rebellion is occurring in the world of portable music.

Lastly, we take a look at the brand-new iPods, the second-generation iPod mini and the 30GB iPod photo, and put them up against their competitors. Just one note of warning: to make best use of our research, read War of the formats (below) and How we test, before moving on to the reviews.

TECHNICAL EDITOR: Darren Ellis

FLASH VERSUS HARD DISK

There are two main types of MP3 players: those that are based on flash memory and those based on hard disks. Flash players use solid-state memory chips to store songs, whereas hard disk players store songs on a real, spinning computer hard disk. Here's a brief comparison of their respective benefits and drawbacks.

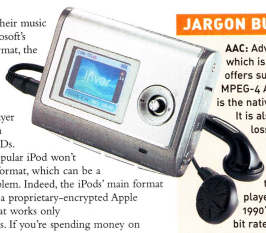
Flash memory players are usually much smaller and, since they have no moving parts, are stronger, more robust and usually have longer battery lives. However, they also have lower capacities. Hard disk-based players now rival flash players for price, offer significantly more storage, but are unsuited to exercising or dancing (despite what you've seen in the adverts), as a spinning hard disk shouldn't be shaken. And if you drop it, it could be damaged beyond repair.

So what else do you get in return for the larger case of a hard disk-based player? One benefit can be line-in and line-out ports. iRiver's H300 series offers both of these; you can even use the line-out port as a second headphone socket for friends. This player even offers a USB host port, the obvious benefit being that you can download your digital photos onto it while away from your main PC, freeing up your camera's memory card. The latest trend seems to be for displaying slide shows of photos, with three players doing precisely that this month.

However, you might also be surprised by the features available on flash players. iRiver again offers recordable FM radios, voice recorders and direct encoding functions so you can record directly from a CD player. They don't just play music.

WAR OF THE FORMATS

What has become a major consideration, and one we can't labour enough, are the formats of music that a player supports. Naturally, every unit plays MP3 files, but this isn't the only format that's widely used. PC users will find that much of their music is in Microsoft's WMA format, the default format that Windows Media Player uses when ripping CDs.



The popular iPod won't play this format, which can be a great problem. Indeed, the iPods' main format is AAC – a proprietary-encrypted Apple format that works only with iPods. If you're spending money on iTunes, beware that this format might become like Betamax in future years. Of course, it may not. Certainly, WMA is guaranteed a long run thanks to the ubiquity of Microsoft and Windows.

Another crucial point when deciding on your player is encryption. Many online music shops sell only encrypted WMA files. In order to play these make sure your chosen player is DRM-enabled, as support for regular WMA files isn't enough.

INTERFACE

Before the iPod came along MP3 players were controlled in a similar fashion to a mobile phone: simple button presses and jog dials. The iPod's innovative wheel design offered a great compromise which let you accurately select single items, navigate menu trees, and zip through large lists via the same mechanism. Now, MP3 players offer a wide range of interfaces including iPod-inspired designs (Creative and iRiver offer a vertical slider), massive button arrays, or the minimal interfaces seen in flash-based, screen-less players.

Also be mindful of screen size and type. Big colour screens are going to suck more juice than tiny LCD displays. You'll likely find that flash players have smaller, minimal displays which, combined with their already long battery life, makes these ideal for users spending time away from the mains.

TAGS VERSUS FOLDERS

Lastly, be aware of the file structure on a player. If you're happy with your music being stored in Windows folders, buy a player that transfers files via UMS (USB Mass Storage, where the player simply appears as a drive in My Computer) as the same folders will appear on your device. Other players organise music via ID3 tags so you can search for songs by artist, album or track name. These players use Windows Media Player, iTunes and similar programs to synchronise.

JARGON BUSTER

AAC: Advanced Audio Encoding, which is part of the MPEG family, offers superior quality to MP3. MPEG-4 AAC is used in iPods and is the native format for iTunes. It is also available as a lossless format.

ATRAC3: Sony's compression standard that was used in MiniDisc players throughout the 1990's. It's available in varying bit rates, but is supported almost exclusively on MiniDisc players.

DRM: Digital Rights Management is a label given to technology that restricts or limits the use of data. Most legal online music stores only offer music that is DRM-protected, which typically ties it to a specific device, or only allows for a limited number of burns.

Lossless: As opposed to lossy compression, which degrades sound quality, lossless formats do not alter the quality of the sound in any way. Instead, the signal is simply compressed, similar to a ZIP file.

Lossy: Lossy compression refers to audio formats that strip away sounds that the ear theoretically can't hear, thereby achieving drastically smaller file sizes. Because lossy compression takes away from the original source, it can compress files much further than lossless formats.

MP3: The most common type of audio compression, developed by Fraunhofer Institute. It supports constant and variable bit rates and is supported by most portable music players.

Ogg vorbis: A lossy compression format, developed by the Xiph.Org Foundation. Its main claim to fame is its royalty free nature, which allows it to be incorporated into software and hardware at no cost. It doesn't offer the same level of support as MP3, although it offers similar, if not better, quality.

WMA: Microsoft's proprietary audio format, available in both lossy and lossless formats. Like Apple, Microsoft's format offers digital rights management, which is compatible with many portable music players.

IRIVER IFP-900 SERIES

PRICE: 256MB $369; 512MB $499

LABS VERDICT

Great performance, excellent build quality and packed with features. The best, but it's pricey.

Ergonomics and design	★★★★★★
Battery life	★★★★★★
Compatibility	★★★★☆☆
Features	★★★★★★
Value for money	★★★☆☆☆
OVERALL	★★★★½

iRiver's iFP-500 series had superb build quality, battery life and features, but a major drawback was the USB 1.1 transfer speed of only 0.6MB/s. The iFP-900 series is an update that doubles this rate, making large transfers much less laborious. It also adds a colour screen and expands battery life to an immense 36 hours.

It offers by far the most robust build quality on show, with its magnesium-alloy case and no moving parts making it ideal for jogging and the gym. Exercisers will also appreciate the ergonomics, with the four side-mounted buttons and directional button making volume tweaking or track skipping a simple process. There's also a Hold switch.

Not the most intuitive player to operate, as each button performs differently depending on mode and duration of press, it wasn't long before our fingers started landing in the right places.

The number of buttons is most useful considering the features. There's a voice-activated microphone, a recordable FM radio and, uniquely here, a line-in port for both analog and optical recording. It also encodes separate tracks if ripping directly from a separate CD player. Despite the relatively small display, the fine-resolution colour screen makes viewing easy.

As for playing music, there are numerous options. There are plenty of permutations of shuffle and repeat of tracks. You'll also find seven preset graphic equalizer settings, as well as custom adjustments and Xtreme EQ for sound-channel tinkerers.

Tracks are organised via Windows folders, which can now be dragged and dropped via My Computer thanks to the new UMS firmware. It's worth noting that there are no DRM benefits/restrictions, which means you can't use it with online stores.

The battery is fixed and rechargeable via a standard mini-USB port. If this is a problem, see the iFP-700 series. Accessories include a leash, arm strap and case. The headphones are from Sennheiser and sound good.

The only downside is the price. The iPod shuffle (see below) and hard disk-based players that are falling in price now conspire to make the iFP-900 series look rather expensive. Nonetheless, as a flash player it can't be topped.

▲ The best flash player on test this month, even if it is a little expensive.

APPLE IPOD SHUFFLE

PRICE: 512MB $149; 1GB $229

LABS VERDICT

The shuffle is a decent player that offers great sound and a high capacity for a pittance.

Ergonomics and design	★★★★½☆
Battery life	★★★☆☆☆
Compatibility	★★☆☆☆☆
Features	★★☆☆☆☆
Value for money	★★★★★★
OVERALL	★★★★☆☆

To be honest, we hooted derisively when the shuffle was first announced. The idea that a screenless flash player that boasted only a shuffle feature was somehow 'innovative' and 'market changing' was ridiculous. Creative made the point that it was offering players with no display five years ago and later added screens as demand increased.

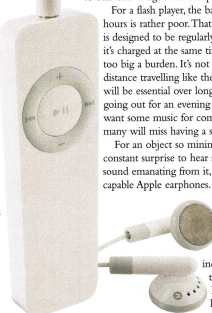
Yet the shuffle sold out everywhere as soon as it appeared – and it's easy to see why. It looks and feels great, a genuine triumph of minimalist design despite its lightweight plastic casing. And it sounds great too. It's all very well for Creative to play down the shuffle, but this iPod's aggressive price triggered significant Creative price reductions. Also, whereas Creative's cheap players look and feel plasticky, and sound poor, the shuffle oozes class and sounds great.

The shuffle has an integral USB 2 plug and appears as a UMS storage device, making it a good-value memory key in its own right. But music files can only be read if transferred via iTunes. It's this that makes the shuffle a good idea. The iPods based on hard disks have moving parts that shouldn't be shaken or dropped, so for the legions of 'poddies' who are already entrenched in the iTunes system it makes sense to also buy a shuffle for use while exercising. iTunes provides automatic synchronisation options that allow for simple random or specified track loading. A transfer rate of 1.7MB/s means such transfers aren't too laborious either.

The directional button on the front makes track skipping and volume adjustments simple. On the back there's a switch that toggles between off, repeat and shuffle modes. There's also a battery test button, which glows green for OK and amber for soon-to-run-out – vague but acceptable.

For a flash player, the battery life of 14 hours is rather poor. That said, as the shuffle is designed to be regularly updated (and as it's charged at the same time), this won't be too big a burden. It's not suited to long-distance travelling like the iRiver, as a screen will be essential over long periods. But for going out for an evening where you just want some music for company, we doubt many will miss having a screen.

For an object so minimal and light it's a constant surprise to hear such crisp and loud sound emanating from it, aided by the capable Apple earphones. It's this that makes the shuffle a joy to own. It doesn't do much but what it does, it does very well – incredibly well for the price. And the large capacity is a huge bonus.



▲ Great looks, great capacity, great price. What more can you ask for?

IRIVER IFP-700 SERIES

PRICE: 128MB $259; 256MB $359

LABS VERDICT	
Ergonomics and design	★★★★★☆
Battery life	★★★★★☆
Compatibility	★★★★★☆
Features	★★★★★☆
Value for money	★★★★☆☆
OVERALL	★★★★☆☆

iRiver's iFP-700 series can be looked on as a AA battery-operated version of the award-winning iFP-900 series. Practically every feature is duplicated, although there's no optical compatibility with the line-in port.

However, it feels a bit chunkier, more plastic and less robust than its relative, and it sports only a mono screen.

In the iFP-700 series' favour is its low price, while battery life is very good at 29 hours. And, of course, AA batteries are available worldwide.

It's the best removable-battery flash player on test.

MSI MEGAPLAYER 521 W/PEDOMETER

PRICE: $165

LABS VERDICT	
Ergonomics and design	★★★★☆☆
Battery life	★★★☆☆☆
Compatibility	★★★☆☆☆
Features	★★★★★☆
Value for money	★★☆☆☆☆
OVERALL	★★☆☆☆☆

The MegaPlayer is a fixed-battery rechargeable player designed for sport. The headphones are over-the-ear types that clip on individually, and it even includes a pedometer. By strapping it to your arm it measures one step per swing. It even measures calorie burning. In practice, the pedometer worked quite well with all information easily readable on the inverse-mono screen.

It's a decent enough player, and we appreciate the FM radio and voice recorder, but it's only worth looking at for the pedometer.

RIO FORGE

PRICE: 256MB $314.95; 512MB $284.95

LABS VERDICT	
Ergonomics and design	★★★★☆☆
Battery life	★★★★★☆
Compatibility	★★★★★☆
Features	★★★★★☆
Value for money	★★☆☆☆☆
OVERALL	★★★★☆☆

The Forge might not have won an award, but it came close. It's quite large and its shape makes one-handed operation a little difficult, but these are the only bad points. Navigation via the directional button is a breeze – using a similar system to other Rio players – and the screen displays lots of information clearly. There's no voice recorder but there's a recordable FM radio (though it's tricky to use). It's one of the only flash players to support DRM files, and an SD card expansion slot means capacity can be boosted by 1GB.

SANDISK DIGITAL AUDIO PLAYER

PRICE: 512MB $214.95; 1GB $259.95

LABS VERDICT	
Ergonomics and design	★★★★☆☆
Battery life	★★★☆☆☆
Compatibility	★★★★☆☆
Features	★★★★☆☆
Value for money	★★☆☆☆☆
OVERALL	★★★★☆☆

SanDisk's first MP3 player looks like an iRiver and possesses many similar features as well as providing DRM support. Consequently, you can organise and transfer files via Windows Media Player, though the fast UMS speed of 6.5MB/s is also useful. But looks do let it down. There's no iRiver chic here, or decent battery life for that matter. The display offers plenty of information but it's tricky to read. The headphones sound fine, though, and it's worth a shout if you want DRM compatibility.

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RIO CARBON 5GB

PRICE: $419.50

LABS VERDICT

Not the most feature-rich player, but it's tiny and gorgeous and does what it's designed for the best.

Ergonomics and design	★★★★★★
Battery life	★★★★☆☆
Compatibility	★★★★★☆
Features	★★★☆☆☆
Value for money	★★★★★☆
OVERALL	★★★★☆

The Rio Carbon was the first MP3 player to offer a 5GB hard disk, its looks went from 'dodgy plastic' to 'iPod-killing chic', and its superb navigation skills got even better.

We're big fans of the menu system, with rounded menu bars that are easy to follow and scroll through. Scrolling itself can be performed via the front directional button or the scroll wheel in the top right-hand corner. The latter is slightly slower but preferable to the iPod's touchpad, as you can use it to easily adjust the volume when fumbling around in your pocket.

Navigation is based on ID3 tags, which can be controlled using Rio Music Manager. This offers some great auto-synchronisation options, such as being able to replace a percentage of your least-played or most-played tracks.

However, the Carbon's WMA-DRM integration makes it compatible with Windows Media Player and most people will use this for all of their library management options.

We're fans of the bookmark feature, which instantly lets you save your place in a long track or audio book. The only other feature is the voice recorder. While it's true that there are no frills like a photo viewer or radio, and also note the lack of a removable battery, we didn't miss them.

Long battery life and high capacity put this player over the finish line first.

If sacrificing such features is what's required to have such a small and usable device then, so far as we're concerned, good.

The only design flaw we found was that the headphone jack has a metal rim. Consequently, if you insert headphones that also have a metal rim you'll get crackling. While this can be fixed with some crafted sticky tape, it's far from ideal. Still, at least the bundled Rio-branded headphones sound great.

Nothing matches the Carbon this month. The iPod mini might take it on for capacity, on-the-go playlists and battery life, but its lack of WMA compatibility will be too problematic for most PC users. The iRiver H10 is another alternative. Indeed, it offers many more features than the Carbon; but it's slightly larger, doesn't handle so well and has an inferior battery life (12 hours to the Carbon's 17 hours). As an all-round player, few will go wrong with Rio's gem.

IRIVER H300 SERIES

PRICE: 20GB Lite, $479; 40GB Lite, $549; 40GB, $599

LABS VERDICT

If you have a huge library, use Windows folders with no ID3 tags and love features – this is the one.

Ergonomics and design	★★★☆☆
Battery life	★★★★☆☆
Compatibility	★★★★☆☆
Features	★★★★★★
Value for money	★★★☆☆☆
OVERALL	★★★★☆

Opinion remains split on whether the H300 series looks cool or ugly. Those who associate carbon fibre with a bleeding-edge Ferrari chassis appreciate its cool black chic. Those who don't, tend to think it's an ugly black box. Whatever your opinion, there's no denying that this is the daddy of feature-rich players. But it definitely looks a little chunky in modern company, as it uses a 1.8in hard disk over the more popular 0.85in alternative.

While we were disappointed to see that the line-in and line-out ports don't offer the digital-out feature of the previous series, you can still use the line-out port as an extra headphone socket, so two people can listen at once. Sound quality using the supplied earphones is good too.

Other features include an internal microphone, which can be voice activated, though an external microphone is also included. This allows for better encoding rates (a maximum of 320Kb/s over 128Kb/s) in MP3 format, offers superior sound quality and doesn't capture the clunks of the hard disk. You can also record from the line-in port or from the radio.

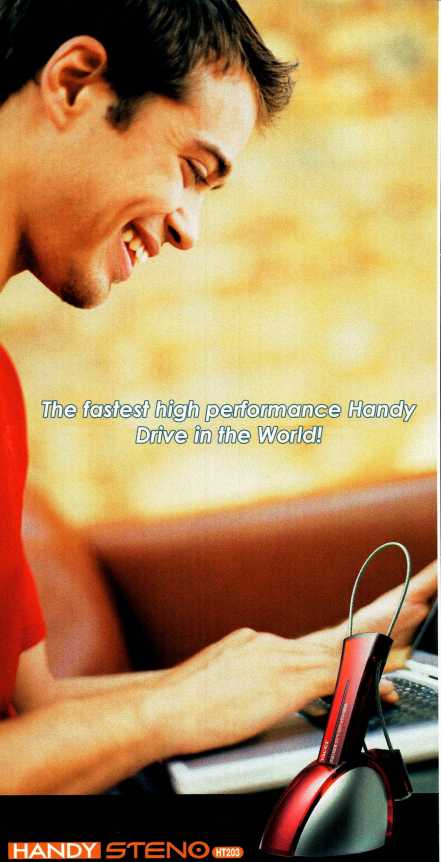
But possibly of most interest is the USB 1.1 host port. With this you can plug in a digital camera or media card reader and transfer files directly to and from the player. While the USB 1.1 standard is a little slow nowadays,

Whether you think it's chic or ugly, this player's performance is up there with the best.

the option of emptying a full memory card over dinner is useful. What's more, thanks to the full-colour display, you can also view your pictures. However, there are limitations: there's no slide show feature, and you can't look at any pictures over 1MB in size.

Though you can import tracks using ID3 tags, this requires setting up a laborious database-scanning process, which isn't actually very good. This player is far better suited to drag-and-drop file transfer and displaying relevant tags only when playing. In terms of battery life, the H300 sits firmly in the middle of the pack, lasting for a respectable 17 hours.

Ultimately, despite the fact that some players have clearly overtaken the H300 in many areas, it still has a much to offer. While the iPod photo may look better, it isn't as versatile.



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APPLE IPOD

PRICE: iPod: 20GB, $439; Mini: 4GB, $299; 6GB, $359; Photo: 30GB, $499; 60GB, $649

It was the third-generation iPod that started it all. We cooed over its minimalist design, unlimited cool and market-enhancing ad campaign. But then a host of other players appeared and highlighted some serious flaws. The touch navigation wasn't responsive. iTunes frequently hung on PCs. The iPod was FireWire-based and if you left it plugged into a PC via USB the battery would drain rapidly. If you left it off overnight it would drain some more, and even a fully charged battery offered poor performance. Then there was the price.

But the first iPod mini quickly followed and many flaws were fixed. Soon after that came the fourth-generation, with price being the only barrier. Next came the 60GB iPod photo, and we had a device as gorgeous as it was unaffordable.

'While Apple has been busy, most other manufacturers have done little.'

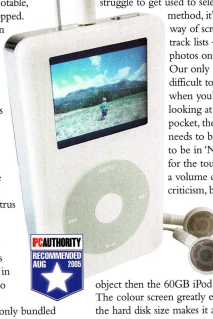
Apple has addressed most of these problems. The range has just been rationalised, meaning there's now only a 20GB iPod, a new 30GB iPod photo to join the 60GB version, and the iPod mini. The mini, now in its second generation, appears in both 4GB and 6GB flavours. Most notable, however, is that prices have dropped.

Indeed, while Apple has been busy, most other manufacturers have done little. Even though iRiver has added minor updates to its flash players, its only significant new product is the H10. Manufacturers such as Cowon, MPIO and Frontier Labs have done little of note. Only Rio's hard disk players offer genuine iPod alternatives. It hasn't bothered replacing the superb Karma, which has since dropped in price, while the Nitrus evolved into the Carbon.

This means Apple is at the forefront of MP3-player technology. The price decreases have brought with them a loss in accessories. The iPod dock is no longer included, neither is the remote, or the carry case. The only bundled accessories are the TV-out cable that accompanies the 60GB iPod photo, the carry clip that comes with the minis and the FireWire cable included with the fourth-generation. Otherwise, all you'll find in the box are the USB connection cable and charger (although note that all the iPods now charge via USB), and the earphones. They're impressive earphones though, offering comparatively good sound quality.

▲ A big one or a little one, the choice is all yours.

▼ Large storage capacity and a colour screen, ideal for use with photos.



All of the players sport the combination touch dial/directional button. Though some people struggle to get used to selecting with this method, it's still the quickest way of scrolling through vast track lists – or thumbnail photos on the iPod photo. Our only quibble is that it's difficult to nudge the volume when you're not directly looking at it. If it's in your pocket, then the Hold button needs to be on. You also need to be in 'Now Playing' mode for the touchpad to work as a volume dial. It's a harsh criticism, but having people's eyes drawn to you every time you waft your iPod around on a train can be unsettling.

If money is no object then the 60GB iPod photo is fantastic. The colour screen greatly enhances usage and the hard disk size makes it a convenient backup for your digital photos. The slide shows are a little gimmicky though. It's a shame there's no USB host for plugging in a flash drive, and that you can only view pictures imported through iTunes.

Fortunately, the previously enormous premium is now easier to swallow with the new 30GB version, which is as slim as the 20GB iPod. The $60 premium over the 20GB iPod is now well worth paying, thanks to the extra 10GB hard disk space and colour screen. Hence it gets the award.

The new iPod mini also wins. With the new pricing scheme, it's now one of the cheapest 'small' hard disk players available. By offering an extra 1GB capacity and far superior battery life over Rio's Carbon and iRiver's H10, it also ramps up the value score.

We're happy to see that iTunes is now stable with PCs. But the key problem of compatibility remains. The iPods' refusal to play WMA files is the single reason that these players didn't storm our group test. Apple is unlikely to concede to vast public demand any time soon either, as it's more than happy to lock its army of 'poddies' into the profitable iTunes Music Store.

Just remember, if you're buying an iPod – they're all now very good – you're not just buying a player, you're buying into a whole system, which may, one day, feel restrictive.

LABS VERDICT

Apple has fixed almost every problem with previous generations of iPods and improved performance and value with the new models. A few features missing, but only compatibility stops these MP3 players approaching the sublime.

APPLE IPOD

Ergonomics and design	★★★★★★
Battery life	★★★☆☆☆
Compatibility	★★☆☆☆☆
Features	★★★★☆☆
Value for money	★★★★★★
OVERALL	★★★★☆☆

APPLE IPOD MINI

Ergonomics and design	★★★★★★
Battery life	★★★★★☆
Compatibility	★★☆☆☆☆
Features	★★★★★☆
Value for money	★★★★★★
OVERALL	★★★★★☆

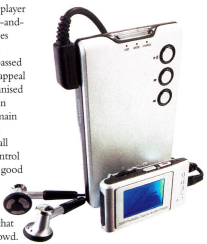
APPLE IPOD PHOTO

Ergonomics and design	★★★★★★
Battery life	★★★★☆☆
Compatibility	★★☆☆☆☆
Features	★★★★★☆
Value for money	★★★★★☆
OVERALL	★★★★★☆

COWON IAUDIO M3

PRICE: 20GB, $429; 40GB $579

LABS VERDICT	
Ergonomics and design	★★★☆☆
Battery life	★★☆☆☆
Compatibility	★★★★☆
Features	★★★★☆
Value for money	★★☆☆☆
OVERALL	★★★☆☆



The M3 is an old-school player that relies more on drag-and-drop transfers than it does ID3 tag navigation. There's no DRM support but the unsurpassed 13.3MB/s transfer speed will appeal to those whose tracks are organised by Windows folders rather than Windows Media Player. The main body of the device is slim and attractive, but the screen is small and appears on the remote control – not great for navigation. It's good to see a line-in port, albeit on the cradle. Unfortunately for Cowon, though, it doesn't have any compelling features that make it stand out from the crowd.

CREATIVE ZEN MICRO

PRICE: 5GB, $379

LABS VERDICT	
Ergonomics and design	★★★★☆
Battery life	★★☆☆☆
Compatibility	★★★★★
Features	★★★★☆
Value for money	★★★☆☆
OVERALL	★★★★☆

Creative has concentrated on build quality with the Zen Micro, with a sturdy feel and compact design. The display is crisp and navigation is easy enough using the touch buttons and vertical trackpad. There are some nice features too, like an FM radio and voice recorder, but special note goes to the removable battery. Then again, its battery life is shorter than others at just 10 hours.

The Creative Zen Micro also features some great audio playback which helps its cause too, but there are better choices for slightly more money.

CREATIVE ZEN TOUCH

PRICE: 20GB, $429; 40GB, $549

LABS VERDICT	
Ergonomics and design	★★☆☆☆
Battery life	★★★★★
Compatibility	★★★★★
Features	★★☆☆☆
Value for money	★★★☆☆
OVERALL	★★★★☆

We've previously criticised Creative's players for being better portable storage devices than MP3 players. The Touch is a step up from the Zen Xtra in that it feels more curved and refined. The trackpad is also better than the appalling jog dial. Yet the Touch still feels like a tank in this competition, weighing in at 220g. At least the Xtra offered a cheap 60GB portable hard disk. Here, a 20GB offering has only modest value. A 21-hour battery life impressed us, and it's one of a handful of large WMA DRM-enabled players, but we still can't recommend buying it.

IRIVER H10

PRICE: 5GB, $499

LABS VERDICT	
Ergonomics and design	★★★★★
Battery life	★★☆☆☆
Compatibility	★★★★★
Features	★★★★★
Value for money	★★★☆☆
OVERALL	★★★☆☆

The H10 feels great, like a thin mobile phone. It was designed to go head-to-head with the iPod mini, while at the same time showing Creative how to really do the vertical trackpad. However, we prefer the directional buttons of previous iRivers.

In addition to an FM radio and voice recorder, there's a text viewer and a photo viewer. You can also view slide shows while music is playing. The 12-hour battery life is disappointing for iRiver: the iPod mini lasts 23 hours. While it does much more than the Carbon and iPod mini, it's more of a jack-of-all-trades than its rivals.

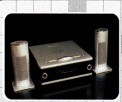
LONGSONG

powered speaker

iPod PSP compatible

Music GO with Me

CONCEPT STEREO SPEAKERS



K1000B

K1000B-mini hi-fi 2.1 speaker
- Ideal for barebones
- Solid aluminum made
- Embedded amplifier function
- Stunning design, stunning performance

K8000B

K8000B-mini 2.1speaker
- Unique concept design
- Cutting-edge acoustic technology
- 5 pocket speakers into I chamber
- Great sound impression

K2000A

K2000A-Portable 2.0 stereo speaker
- Elegant design for notebook, mp3 player
- Solid aluminum design
- Multiple power supply (USB Battery, AC/DC)
- Incredible rich sound

K2000B

K2000B-Portable 2.0 stereo speaker
- Elegant design for notebook, mp3 player
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Performance Analysis

There's more to MP3 players than the size of its disk.

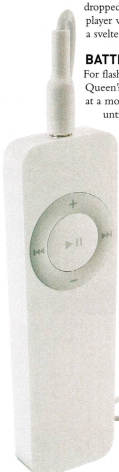
When it comes to MP3 players, it's far too easy to make a buying decision based on looks alone. And it's easy to see why, too: the classy design of the iPod mini can push objectivity out of the window. While style certainly forms part of our conclusion, we've added some extra star ratings this month to more accurately reflect the MP3-player world. We now have Ergonomics & Design, Battery Life, Compatibility, Features, Value and Overall. Here's how we calculate each rating.

ERGONOMICS & DESIGN

This is the most subjective rating. We passed the players among the team to find out which are the easiest to use. Looking nice was all well and good, but if it took two hands to operate a player, or the navigation buttons were a pain, or if we couldn't follow the menu structure, then scores dropped. A big and chunky player was less desirable than a svelte equivalent too.

BATTERY LIFE

For flash-based players, we set Queen's Bohemian Rhapsody at a moderate volume repeatedly until the battery died. With hard disk players it's necessary to keep the hard disk active, as it would be in the real world – otherwise, a song could just be played from onboard flash memory. Consequently, we got each hard disk player to play a 200MB selection of songs until the battery ran out. Just note that battery life will be less if you're regularly skipping between tracks.



COMPATIBILITY

Compatibility is becoming a big problem. Many PC users are buying players such as iPods, only to find that they won't work with their WMA-based music library. They then have to convert their whole collection. People are also buying encrypted tracks from online stores and finding their players won't play them. We gave points for every format supported, but with an onus on WMA and encrypted WMA files, as these are the most common. Ogg Vorbis is also rewarded, while proprietary systems such as Apple's AAC and Sony's ATRAC lost out.

FEATURES

If you look at the feature table you'll see a breakdown of each player's capabilities and accessories. We assigned points for each feature depending on how important it is. We also assigned points here for file-transfer speed. While this isn't important enough for its own category, it's still useful. We transferred 37 tracks (exactly 200MB) using the main transfer method for

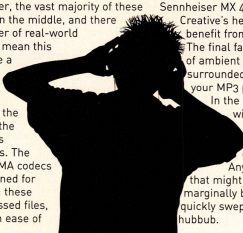
SOUND QUALITY

In this group test, we didn't place a huge amount of emphasis on sound quality. This doesn't mean we ignored it: where appropriate, we'll always say whether a player is especially good or especially bad. However, the vast majority of these players sit in the middle, and there are a number of real-world factors that mean this shouldn't be a big factor in your buying decision.

The first is the quality of the music files themselves. The MP3 and WMA codecs aren't designed for audiophiles: these are compressed files, created with ease of storage and transfer in mind rather than fidelity. That said, the standard of bundled headphones has improved significantly in recent years. While we were particularly impressed by the Sennheiser MX 400 earbuds, only Creative's headphones would benefit from an upgrade.

The final factor is the amount of ambient noise you're likely to be surrounded by when listening to your MP3 player.

In the majority of cases, there will be a lot of background noise on the streets, in the office or on the train. Any subtlety or nuances that might be provided by marginally better earphones will be quickly swept away in the everyday hubbub.



FLASH PLAYERS

	Apple iPod shuffle	iRiver iFP-700 series	iRiver iFP-900 series	MSI MegaPlayer 521 w/pedometer	Rio Forge	SanDisk Digital Audio Player
OVERALL RATING						
Price	512MB $149; 1GB $229	128MB $259; 256MB $359	256MB $369; 512MB $499	512MB $185	256MB $314.95; 512MB $384.95	512MB $214.95; 1GB $259.95
Supplier	Apple	I-Tech	I-Tech	MSI Computers	Expansys	Expansys
Phone	13 36 22	1800 833 883	1800 833 883	(02) 9748 0070	(03) 8415 0848	(03) 8415 0848
Internet	www.apple.com.au	www.i-tech.com.au	www.i-tech.com.au	www.msicomputer.com.au	www.expansys.com.au	www.expansys.com.au
PLAYER SPECIFICATIONS						
Storage	Solid state	Solid state	Solid state	Solid state	Solid state	Solid state
USB mass storage device	Yes	Yes	Yes	Yes	Yes	Yes
Audio formats	MP3; AAC; WAV	MP3; WMA; ASF; OGG	MP3; WMA; ASF; OGG	MP3; WMA; WAV	MP3; WMA	MP3; WMA
FM radio	No	Yes	Yes	Yes	Yes	Yes
Voice recorder	No	Yes	Yes	Yes	No	Yes
Line-in	No	Yes	Yes	No	No	No
Display	No	Mono; 25 x 12mm; 4 lines	Colour; 24 x 19mm; 8 lines	Mono; 20 x 12mm; 4 lines	Mono; 26 x 20mm; 6 lines	Mono; 30 x 15mm; 4 lines
Graphic equaliser	No	7 presets	7 presets	4 presets	5 presets	4 presets
Player interface	USB plug	Mini-USB	Mini-USB	Mini-USB	Mini-USB	Mini-USB
PC connection	USB 2	USB 2	USB 2	USB 2	USB 2	USB 2
Main transfer methods	iTunes	iRiver Manager; UMS	iRiver Manager; UMS	UMS; Windows Media Player	Rio Music Manager; UMS; Windows Media Player	MusicMatch JukeBox; UMS; Windows Media Player
Organisation	Track listing	Windows folders	Windows folders	Track listing	ID3 tags	Windows folders
Battery	Fixed rechargable	1 x AA	Fixed rechargable	Fixed rechargable	1 x AAA	1 x AAA
USB/FireWire rechargable	Yes	No	Yes	Yes	No	No
Dedicated volume button	Yes	No	No	No	Yes	No
Hold button	No	Yes	Yes	Yes	Yes	Yes
Other features	Integral USB plug; battery check button	Line-in (analog and optical recording; separate track encoding; Xtreme EQ; recordable FM radio; voice-activated recorder	Line-in (analog and optical recording; separate track encoding; Xtreme EQ; recordable FM radio; voice-activated recorder	Stopwatch; pedometer; calorie counter; recordable FM radio	Stopwatch; lap timer; bookmarks; recordable FM radio; SD card expansion slot	Balance
Width x depth x height (mm)	25 x 9 x 85	96 x 27 x 35	64 x 19 x 51	80 x 16 x 50	68 x 22 x 68	73 x 20 x 33
Weight inc battery (g)	22	62	63	60	63	60
SOFTWARE AND ONLINE STORES						
Software included	iTunes	iRiver Manager	iRiver Manager	MSI MegaDriver	Rio Music Manager; Windows Media Player	Rio Music Manager; MusicMatch
DRM	Yes	No	No	No	Yes	Yes
Music store compatibility	iTunes AAC	No	No	No	WMA-based	WMA-based
BUNDLED ACCESSORIES						
Earphones	Apple proprietary	Sennheiser iRiver brand	Sennheiser iRiver brand	MSI rear clip sports headphones	Sport clip Rio headphones	Unbranded
Remote control	No	No	No	No	No	No
Other	Neck strap	Carry case; arm band; neck strap; 3.5mm audio cable	Carry case; arm band; neck strap; 3.5mm audio cable	Arm straps; USB extension cable; USB to mini-USB adaptor	Carry case; arm band	Carry case; arm band
Optional accessories	Mini speakers; cases	Waterproof housing	No	No	Car charger	No

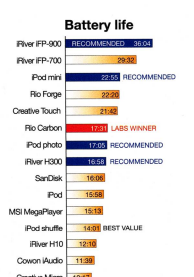
that player. Flash and non-DRM hard disk players use UMS (USB Mass Storage) device transfer – drag and drop through Windows. iPods use iTunes. Otherwise, we used the excellent Windows Media Player because supplied applications are usually poor in comparison.

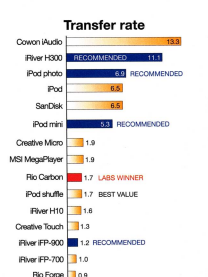
VALUE FOR MONEY

The value score were worked out by taking a weighted average of the players' totals in all the categories listed above, and then factoring in the price of the device. The Best Value award went to the player with the highest score in this category.

OVERALL

This, very simply, is an average of all the other scores. We gave a Labs Winner award to the one device that scored highest overall, with Recommended awards going to the closest runners-up.





	Apple iPod	Apple iPod mini	Apple iPod photo	Cowon iAudio M3	Creative Zen Micro	Creative Zen Touch	iRiver H10	iRiver H300 series	Rio Carbon 5GB
HARD DISK PLAYERS									
OVERALL RATING									
Price	20GB $439	4GB $299; 6GB $359	30GB $479; 60GB $649	20GB $429; 40GB $579	5GB $379	20GB $429; 40GB $549	5GB $499	20GB Lite $479; 40GB Lite $549; 40GB $599	5GB $419.50
Supplier	Apple	Apple	Apple	Mstation.com.au	Creative	Creative	I-Tech	Mstation.com.au	Expansys
Phone	13 36 22	13 36 22	13 36 22	1300 131 035	(02) 9021 9800	(02) 9021 9800	1800 833 883	1300 131 035	(03) 8415 0848
Internet	www.apple.com.au	www.apple.com.au	www.apple.com.au	www.mstation.com.au	www.australia.creative.com.au	www.australia.creative.com.au	www.i-tech.com.au	www.mstation.com.au	www.expansys.com.au
PLAYER SPECIFICATIONS									
Storage	Hard disk	Hard disk	Hard disk	Hard disk	Hard disk	Hard disk	Hard disk	Hard disk	Hard disk
USB mass storage device	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Audio formats	AAC; AIFF; MP3; WAV	AAC; AIFF; MP3; WAV	AAC; AIFF; MP3; WAV	MP3; WMA; ASF; OGG; WAV	MP3; WMA	MP3; WAV; WMA	MP3; WMA	MP3; WMA; ASF; OGG; WAV	MP3; WMA
FM radio	No	No	No	Yes	Yes	No	Yes	Yes	No
Voice recorder	No	No	No	Yes	Yes	No	Yes	Yes	Yes
Line-in	No	No	No	Yes (on cradle)	No	No	No	Yes	No
Display	Mono; 40 x 31mm; 8 lines	Mono; 30 x 25mm; 6 lines	Colour; 40 x 31mm; 8 lines	Mono; 25 x 18mm; 6 lines (remote only)	Mono; 35 x 20mm; 6 lines	Mono; 43 x 30mm; 7 lines	Colour; 28 x 28mm; 8 lines	Colour; 40 x 31mm; 8 lines	Mono; 25 x 18mm; 6 lines
Graphic equaliser	22 presets	22 presets	22 presets	5 presets	8 presets	8 presets	27 presets	5 presets	5 presets
Player interface	Proprietary	Proprietary	Proprietary	Mini-USB (on cradle)	Mini-USB	Mini-USB	Proprietary	Mini-USB	Mini-USB
PC connection	USB 2; FireWire 400	USB 2	USB 2	USB 2	USB 2	USB 2	USB 2	USB 2	USB 2
Main transfer methods	iTunes	iTunes	iTunes	JetShell application; UMS	Creative MediaSource; Nomad Explorer; Windows Media Player	Creative MediaSource; Nomad Explorer; Windows Media Player	iRiver Plus; UMS; Windows Media Player	iRiver Manager; UMS	iTunes; Rio Music Manager; UMS; Windows Media Player
Organisation	ID3 tags	ID3 tags	ID3 tags	Windows folders	ID3 tags	ID3 tags	ID3 tags; Windows folders	ID3 tags; Windows folders	ID3 tags
Battery	Fixed rechargable	Fixed rechargable	Fixed rechargable	Fixed rechargable	Removable rechargable	Fixed rechargable	Removable rechargable	Fixed rechargable; or 4 x AA battery pack	Fixed rechargable
USB/FireWire rechargable	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Dedicated volume button	No	No	No	Yes	No	Yes	No	No	Yes
Hold button	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Key combination
Other features	Calendar; text viewer; games	Calendar; text viewer; games	Photo viewer; calendar; text viewer; games; TV-out on 60GB version	JetEffect audio enhancements; line-out on cradle and port extender; recordable FM radio	USB charger; PIM; bookmark; alarm clock	No	Photo viewer; recordable FM radio; text viewer; SRS WOW audio	USB 1.1 host; line-in/out; SRS WOW audio; photo viewer (JPEG and BMP); text viewer	Bookmark; stopwatch
Width x depth x height (mm)	62 x 15 x 104	50 x 19 x 92	62 x 15 x 104	60 x 14 x 104	51 x 19 x 84	70 x 25 x 105	96 x 15 x 54	103 x 23 x 62	62 x 14 x 84
Weight inc battery (g)	159	102	167	136	108	220	96	183	62
SOFTWARE AND ONLINE STORES									
Software included	iTunes	iTunes	iTunes	JetShell; JetAudio	Creative MediaSource; Windows Media Player 10	Creative MediaSource; Nomad Explorer	iRiver Plus	iRiver Manager	Rio Music Manager; Windows Media Player; iTunes plug-in
DRM	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Music store compatibility	iTunes AAC	iTunes AAC	iTunes AAC	No	WMA-based	WMA-based	WMA-based	No	WMA-based
BUNDLED ACCESSORIES									
Earphones	Apple proprietary	Apple proprietary	Apple proprietary	Cresyn	Creative proprietary	Creative proprietary	Sennheiser MX 400	Sennheiser MX 400	Rio proprietary
Remote control	No	No	No	Yes	No	No	No	Yes	No
Other	FireWire cable	Carry clip	TV-out cable	Carry case; cradle; line-in/out cable; port extender	Belt clip and stand; pouch	Carry case	Carry case	USB to mini-USB converter; 3.5mm line-in cable; external microphone; external AA battery pack3; docking station5	No
Optional accessories	Dock; basic remote; car dock; carry case; memory card reader; voice recorder; FM radio; speakers; extra battery and others	Dock; FireWire cable; basic remote; car dock; carry case; memory card reader; voice recorder; FM radio; speakers; extra battery and others	Dock; FireWire cable; basic remote; car dock; carry case; memory card reader; voice recorder; FM radio; speakers; extra battery and others	No	No	No	Remote control; cradle with line-out lead; spare battery	No	Carry case

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xpc

10 ways to save money with your PC

Are you using technology to save money? Well you should be. David Hellaby looks at the ten best ways to save with your PC.

Almost two-thirds of all Australian households now have at least one computer and many of them have two. For most, the PC is a necessary expense for the kids' education or to help with work or running the family business.

It has some added advantages such as communication through the internet and being able to print your own photographs as well as keeping at least some of the family entertained with games or downloaded music.

Often it is an expensive device that requires continual added outlay on servicing, upgrades and items such as ISP fees and anti-virus software.

However, there are ways to make your PC and internet connection pay for themselves and slash the household budget at the same time.

Some are as simple as knowing where to shop online, others may involve an initial outlay that will repay itself many times over. But in the long run the smart consumer is looking at savings of $20 and $50 a week. Read on to find *PC Authority's* top ten ways to save money. ▶

01 BROADBAND VS DIAL UP

POTENTIAL SAVINGS: $15 to $25 a month

The first thing to look at is your internet connection. The average family of four that goes online daily to check email and surf the net using a dial up connection will make up to a 100 local calls a month connecting to the internet. Most will have an unlimited hours plan costing up to $30 a month bringing their total monthly outlay for ISP fees and phone calls to about $47.

In some cases they will have installed a dedicated phone line just for going online costing another $30 a month in line rental bringing their total outlay to $75.

None of this takes into account the initial one off cost of installing the second line in the first place or the cost of the modem required for internet access.

MAKE THE SWITCH

Switching to a broadband (ADSL or cable) connection has many advantages.

It costs about $99 for an ADSL modem and you can get a combination modem and router for around $149 that allows you to share your connection with up to three other computers at the same time. However, many ISPs will provide the modem and installation for free if you sign up for anything other than their cheapest plan.

ADVANTAGES

Broadband is between 10 and a thousand times faster than dial up; is always on so you are not charged for dialling in; and is much easier to share between multiple computers. Once you have broadband you can make further savings by using Voice over IP (VoIP).

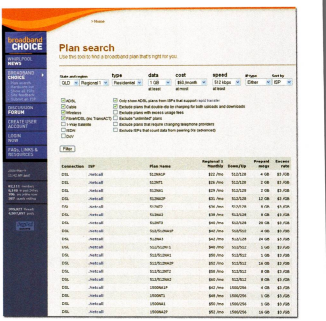
DISADVANTAGES

Rural and regional consumers don't always have the same selection of ISPs as city users and therefore may have to pay higher fees or accept lower data limits. Once you exceed your limit it can cost about 15 cents a megabyte for extra data and your bill will mount up rapidly, however, the likes of BigPond warn you when you are approaching your monthly limit.

Because you have an 'always on' connection it is more vulnerable to unwanted intruders so it is even more important to ensure your anti-virus software is always up to date. It also is necessary to take added precautions such as installing a personal firewall to block hackers.

If you are a light user (ie you only use it for email and the occasional web surf without downloading files such as music) your ISP fees could be as little as $29.95 a month and there are no local call charges so you are immediately saving at least $15 a month.

Because ADSL allows you to use one line for both phone calls and the internet at the same time there is no need for a second line and if you are a regular user and download the occasional MP3 file, game demo or software update you can get a suitable plan for around $50 a month – $25 less than the $75 a month it was costing for your connection through a second line. To find a suitable ISP and broadband plan that suits your needs and budget go to www.whirlpool.net.au and search plans in the Broadband Choice section of the site.



▲ Most people now have a choice of broadband carriers and can save money by shopping around.

02 USING VOICE OVER INTERNET PROTOCOL (VOIP)

POTENTIAL SAVINGS: $10 or more a week

Forget the name, just appreciate the benefits. A lot of pundits claim VoIP (pronounced 'voyp') could be the biggest thing in communications since Alexander Graham Bell invented the telephone. It certainly has the potential to slash your phone bill and it is now readily available in Australia.

VoIP transmits your voice from one phone to another using the internet – and it does it at a fraction of the cost of using the public switched telephone network (PSTN).

There are several ways you can set up a VoIP connection but by far the easiest is to use an ATA (analog telephone adapter) that a standard telephone can be plugged into. It will cost you about $150, depending on the hardware. Apart from that all you need is a broadband connection and a router. Using a modem/router saves money and is less complex to set up.

▼ Voice over IP can save the average family up to $500 a year off their phone bill.

In most cases you just plug the VoIP adapter into one of the Ethernet connections in your modem/router and connect your phone to the adapter.

Once the hardware is set up you should have a dial tone on the phone and your first phone call will be to your VoIP service provider to activate your account – it literally takes less than five minutes provided your hardware setup is compatible.

You will be allocated a phone number and will be up and running, able to make local and interstate calls for as little as 10 cents a call; calls internationally are even cheaper.

Depending on your VoIP provider, calls to the United States and the United Kingdom can cost less than three cents a minute and calls to anybody else using the same set up and service provider are often free – where ever they are.

The voice quality varies depending on the type of connection you have and the location you're calling to.

Businesses have been using VoIP for a few years but it has only been available as a hardware solution to Australian consumers since late 2004.

Industry analysts IDC forecast consumer VoIP to be one of the top 10 technologies in 2005 and one of the fastest growing.

ADVANTAGES

Recent studies estimate VoIP can save the average Australian family about $500 a year through lower call charges. It is easy to set up and has all of the features of a standard phone including caller ID and voicemail, with the added advantage of having email notification of voicemail messages.

DISADVANTAGES

Call quality can be affected by congestion. If your data rate falls so too will the quality of the phone connection. Emergency services are concerned that 000 calls made on VoIP phones are difficult to trace quickly and as a result lives could be endangered if they are unable to locate the caller.

If you lose your internet connection, your phone service goes down too. Additionally, if you have ADSL you still have to pay a line rental charge because your internet connection requires a PSTN phone line.

03 ONLINE BANKING

POTENTIAL SAVINGS: $2.80 per transaction

There has been a lot of adverse publicity about the dangers of online banking; however, with commonsense precautions, online banking can be as secure as any other form of banking – and cheaper.

It is essential to have a good third party firewall (don't just rely on the firewall provided by Windows XP Service Pack 2 or the NAT firewall in your modem/router), and to keep your antivirus up-to-date. You also have to practice safe computing by not opening email attachments you weren't expecting and not storing valuable personal information such as bank account details and credit card numbers on your PC.

Talk to your bank about making your accounts available online and what you require to use BillPay facilities or transfer funds between your own accounts. Also, check the requirements for transferring between banks so you can make direct payments to people such as tradesmen. This not only saves time but saves money on postage, cheque fees and the cost of getting to and from the bank. For example your bank may charge you as little as 20 cents to make a bill payment or direct credit over the internet compared to an all up cost of about $2 to post a cheque. Internet transfers also save the recipient time and money as they don't have to pay any charges for depositing cheques and the money is cleared as soon as it reaches their account.

Once you are set up for online banking get people such as employers to pay direct into your accounts and try to pay your bills the same way. The cost of an online transaction is about a tenth of the cost of an over-the-counter transaction and can save you hundreds of dollars a year. ▶

ADVANTAGES

Lower bank fees, 24 x 7 access and better management of your bank accounts.

DISADVANTAGES

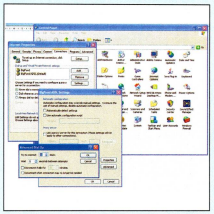
Your bank accounts can become vulnerable to online thieves if the proper security precautions are not taken.

HOW TO: STOP THE DISCONNECT

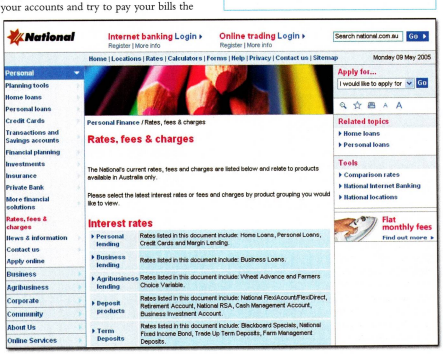
A simple way to save money on your dial-up connection is to stop Windows from automatically disconnecting from the Net when it does not detect any activity. By default Windows is set to sever the connection if it does not detect any activity after 20 minutes, however, it often fails to detect when you are downloading a large file and cuts you off.

To prevent this happening and save on the cost of local calls, go to Windows Control Panel and open Internet Options. Click on the Connections tab and go to Settings. Click on the Advanced button and in the Advanced Dial Up Setting uncheck the 'Disconnect if idle for 20 minutes' box.

Alternatively increase the time to 60 minutes or more. This simple tweak can cut your bill for local calls in half.



▲ Stopping Windows from disconnecting your dial-up connection can save you on your next bill.



04 EMAIL AND INSTANT MESSAGING

POTENTIAL SAVINGS: Hard to quantify but savings can be realised in lower toll bills, reduced or eliminated fax charges, and minimised courier costs.

Email has become so much part of our everyday lives that we forget how much it saves us in phone, fax and postage bills. Almost anything that can be converted to data including documents, images and audio can be sent by email if you are able to reduce it to a manageable size. It has become an essential tool for business and one of the most visible indications as to how it is saving companies is the reduction in the number of bicycle couriers on our streets. A recent survey in the United States shows the number of bicycle couriers in major cities such as New York and Philadelphia has dropped by two thirds in the past five years as companies take advantage of broadband and email to transfer documents quickly.

Instant messaging is also finding its way into the workplace and is now the preferred method of communication among many families and friends who live apart. Messaging can be either in text or audio/visual and enables you to keep in touch with friends, relatives and business people around the world for just the cost of your internet connection. With the right set up (webcam, microphone and software) you can even make video calls or send SMS messages from you PC to mobile phones.

ADVANTAGES

Email is cheap, fast and ideal for transmitting documents and images. Instant messaging is, as the name suggests, instantaneous and you can block unwanted people from your conversations. Both are ideal for keeping in touch with distant friends and relatives, and are rapidly becoming essential for business.

DISADVANTAGES

Both are prone to spam and viruses. Video messaging can be complex to set up and requires both parties to have similar equipment.

THE GREAT PHOTO MYTH

One of the great misconceptions of recent times is that it is cheaper to create your own photo prints at home from a digital camera than it is to get a film developed and printed at a photo shop.

Not true!

Consumer services are available that will develop and provide 6" x 4" matt prints from a 36 frame 35mm film for as little as $8.95 with an extra copy of all of the prints for $5.95.

If you only take 36 prints you are paying an average of a fraction under 25 cents a photo and the price per pic drops to just under 21 cents if you go for double prints. The initial cost of the film adds between 11 and 16 cents to the cost of the print.

Even if you use one of the online services that charge 35 cents a print or a or pay $11.95 a roll, which works out at 33 cents a print, you are still paying less than it would cost at home.

Unless you have a special purpose 6 x 4 photo printer, most people will be printing their photographs on A4 paper with a maximum of four 6"x4" prints per sheet. A survey of the major printer companies shows that that average A4 size print will cost between $2 and $3 – depending on the printer and the number of ink colours used. That equates to between 50 cents and 75 cents per 6" x 4" print.

That cost is based on the cost of paper and ink and does not take into consideration the cost of the printer.

So why is digital photography so popular? Convenience and control. You can edit photos before printing them and then you only print the photos you want.

Where you can save money is by burning your photographs to CD. While several companies now offer to do it for you the cost is around $14.95, however, you can do it yourself for less than $2.

05 BUYING MUSIC

POTENTIAL SAVINGS: Up to $20 a CD.

It has taken a while but Australians can now buy music online legally and save a lot of money doing it. At present there are only two major local music download sites – Destra Music (http://mp3.destramusic.com/) and BigPond Music (http://bigpondmusic.com) – with the latter dominating the market. Tracks from top name artists are available for as little as 99c a track meaning consumers can download an entire album and burn it to their own CD or load it on to their MP3 player for up to $20 less than the store version.

ADVANTAGES

Generally much cheaper than store bought music and you can create your own compilation albums. Being in MP3 format means you can get far more songs onto a single CD.

DISADVANTAGES

You need an MP3 player or a CD player capable of playing MP3 files. Downloads can take time and if you are not a BigPond subscriber they can eat into your data limit.

06 BUYING MOVIE TICKETS

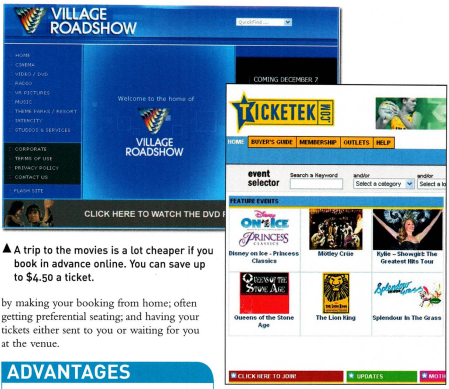
POTENTIAL SAVINGS: $4 per adult movie ticket plus discounts and specials from the candy bar and other entertainment venues.

According to the Australian Bureau of Statistics about two thirds of us go to the movies at least once a year. Many of us go more regularly than that and quite a few go as often as once a week. Buying your ticket online before you go can save you up to $3.50 a ticket. However, you can save even more by joining the likes of Greater Union's Cinebuzz Club or the Village or Hoyts Movie Clubs which also offer discounts on food and drink.

All you have to do is log on to your local cinema through www.villagecinemas.com.au, www.hoyts.com.au or www.greaterunion.com.au, select the purchase tickets online menu and choose the movie and session you want to go to.

You pay for the tickets online with a credit card and collect them at the theatre.

Both event ticket providers Ticket Master (www.ticketmaster.com.au) and Ticketek (www.ticketek.com.au) offer online specials for a wide range of entertainment from opera to orienteering. While you might not always get a discount, you can save time and money ▶



▲ A trip to the movies is a lot cheaper if you book in advance online. You can save up to $4.50 a ticket.

by making your booking from home; often getting preferential seating; and having your tickets either sent to you or waiting for you at the venue.

ADVANTAGES

Saves time and money and often gets you preferential seating. You can select from an online seating plan for concerts and sporting events.

DISADVANTAGES

No discount for Gold Class cinemas and the online transaction fee makes Gold Class more expensive.

07 BOOKING AIRLINE TICKETS

POTENTIAL SAVINGS: Up to $2400 for a family of two adults and two teenagers for return tickets between Brisbane and Sydney or Melbourne and Sydney. Savings of several hundred dollars for trans-Tasman airfares.

Next time you plan your holiday, pause before rushing off to your local travel agent. You can slash hundreds of dollars from the cost of your annual vacation by some judicious use of the internet. Airlines, cruise lines, hotels and motels and even rental car companies regularly use the internet to offer special deals at a fraction of the normal rate.

For example: a full fare return economy flight on Qantas between Sydney and Brisbane costs about $734 of which just under $56 is taxes and charges. However, by booking in advance and taking advantage of the ongoing price war between Qantas (www.qantas.com.au) and Virgin Blue (www.virginblue.com.au) the same trip could be made for as little as $134 ($39 each way plus taxes and charges) – a saving of $600 on the standard economy fare. For a family of four (two adults and two teenagers) that's a massive saving of $2400. While those fares are only available a few times a year, both airlines regularly offer $100 (including taxes and charges) fares between eastern state capitals. Qantas off-shoot, JetStar, regularly offers $59 (inclusive) fares to several destinations. However, be prepared to pay an extra $2 to $3 for credit cards fees and an extra $7 if your domestic flight departs from an international terminal.

▲ Booking shows and sports evens online not only can save money; it also gives you a better chance of getting the best seats.

While the airlines offer cheap fares through travel agents and for phone bookings, making and paying for your booking online is usually at least $10 a ticket cheaper (for the same specials) and more convenient. Confirmation and your e-ticket are received by email within minutes.

Virgin, Qantas, Air New Zealand (www.airnz.com.au) and FreedomAir (www.freedomair.com.au) are also involved in a trans-Tasman price war with return flights to New Zealand available for as little as $300.

However, sometimes the cheapest trans-Tasman flights can be found through third part travel sites such as Flight Centre (www.flightcentre.com.au), which offers a one-stop shop for finding all of the cheapest online fares and Perth-based Best Flights (www.bestflights.com.au), which allows you to search for the cheapest flights available to anywhere in the world and gives you access to more than 20 international airlines.

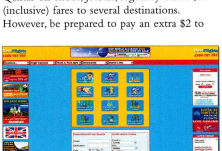
However, unlike the Flight Centre and individual airline sites, you have to book by email and cannot pay for your fares online. While this makes it difficult to book last minute flights you can book entire holidays packages including accommodation, cruises, and rental cars. ▶

ADVANTAGES

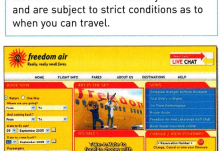
Huge savings are available if you know where and when to look.

DISADVANTAGES

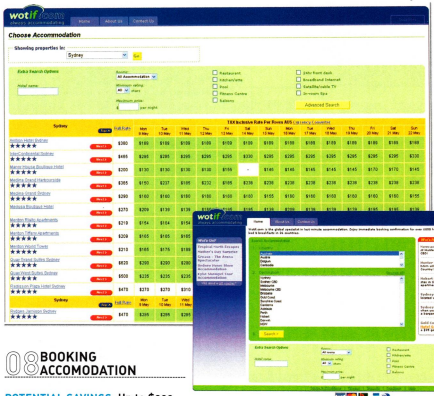
There is often limited availability of the really cheap fares and they are 'use it or lose it' fares with no refund if you cancel and are subject to strict conditions as to when you can travel.



▲ Perth-based Best Flights provides a travel and accommodation database that allows you to search for the lowest fares.



▲ Airline sites are a good place to find the cheapest airfares going. A family of four can save thousands booking online.



08 BOOKING ACCOMODATION

POTENTIAL SAVINGS: Up to $300 a night for 5-star accommodation; $200 a night for 4-star and $100 a night for 3-star accommodation within Australia. Even bigger savings may be available from overseas destinations.

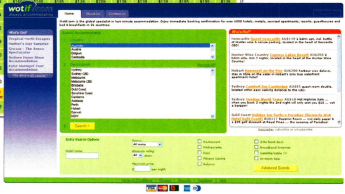
If you walk in off the street, or book accommodation direct or through a travel agent, you usually will be expected to pay the rack, or standard room rate.

However, many hotels, motels and resorts will discount any rooms still unbooked within a fortnight of any date. Discounts range from 20 to as much as 60 percent and often include specials such as free breakfast or welcome packages for guests. These discounts are usually only available over the internet and not through travel agents.

Websites such as the highly successful Brisbane-based Wotif.com, LastMinute.com.au, www.check-in.com.au, www.ratestogo.com, www.standbyrates.com.au and www.needitnow.com.au all offer big savings on accommodation within Australia and in most cases will show you both the rack rate and the discount rate so you know how much you are saving.

You can use the same technique if you are planning an overseas holiday. Wotif.com offers last minute accommodation (up to 14 days before your stay) in dozens of countries. However, if you want to book further in advance try international sites such as www.travelnow.com, www.hotels.com and www.hoteltravel.com, all of which offer 'internet only' specials.

But be sure to check what currency they are quoting the room rates in. They are quite often in US dollars, pounds Sterling or the currency of the country where you are booking your stay.



▲ Hotels, motels and resorts often slash their rack rate to fill vacant rooms enabling travellers to make big savings by booking online within 14 days of travel.

ADVANTAGES

Big savings at a good selection of hotels and motels and you often will find higher rated accommodation is now within your budget. You can book and pay online and get immediate confirmation of your booking.

DISADVANTAGES

By using a last minute site you might not be able to get the hotel or motel of your choice. And during peak periods or when there is a special event on near where you want to stay it might be difficult to find accommodation. If using an international site prices, might be quoted and charged in foreign currency and you might not get the optimum exchange rate.

09 WINE ONLINE

POTENTIAL SAVINGS: Up to $20 on a wine that normally retails for $25.95

Over the past three decades Australia has progressively moved from a nation of beer swillers to a country of wine drinkers. Australian wine makers are among the best in the world and the average quality of Australian wine is higher than most other wine producing nations.

As a result we drink a lot of wine, so it is only natural we should look for the best deals possible. Surprisingly they are quite hard to find online because any savings are often reduced or even wiped out by the cost of delivery and the fact you have to order a dozen at a time. Several companies have tried selling discount wine online and either failed or have been bought out by major liquor chains. There is one standout exception, wine liquidator Get Wines Direct (www.getwinesdirect.com). The company, which started on the Sunshine Coast a few years ago and now has a major facility in Melbourne, offers discounts ranging from 20 to 70 percent on both cleanskin and labelled wines; daily free carton specials and free door-to-door delivery. The only condition

WATCH THE BILL

The internet presents consumers with a virtual global shopping arcade, however, it does not always provide savings. Even things that appear to be a bargain can turn out to be more expensive in the long run.

For example buying groceries online is convenient and time saving but is unlikely to save you any money. In fact, once you take into account delivery charges your grocery bill is likely to be higher than if you went to the store yourself.

The same applies to online florists, giftshops and many other merchants who provide online ordering as a convenience rather than a cost saver.

If you are buying something from overseas always check the delivery charges and foreign exchange rates before finalising your purchases. If it is an expensive item it also pays to check with the Customs Department to ensure it is not subject to import duty, which can double the original price.

is that you must order a minimum of a dozen bottles at a time; however, you can make up your own dozen. There are hundreds of wines to choose from including many from major, well credentialed wineries.

The connoisseur can also find the occasional excellent bargain through Oddbins, an Adelaide-based wine auctioneer. While it costs $22 a year to subscribe to the website, $88 for full membership, plus an 11 percent buyers premium and freight charges, the canny buyer can make that up with a single winning bid at any of the monthly auctions.

ADVANTAGES

A wide selection of wines ranging from average to premium quality available at better than cellar door prices. Savings of $100 or more a dozen are common with Get Wines Direct.

DISADVANTAGES

Minimum purchase of a dozen bottles for Get Wines Direct. With Oddbins you are often buying blind and you have to add a buyer's premium and delivery charges to the overall cost.

▼ Getwinesdirect.com offers savings of up to 70 percent on good quality wines and delivers for free.

10 ONLINE REAL ESTATE

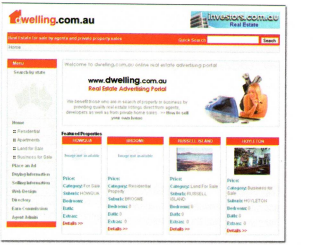
POTENTIAL SAVINGS: About $7000 on a $200,000 property and $16,500 on a $600,000 property.

While the boom may have gone out of the property market in many parts of the country, people are still finding ways to make money out of real estate. One way to get the best deal is to buy or sell privately and there are a growing number of real estates on the net that are dedicated to private real estate and business sales. Sites such as www.australiarealty.com, www.noagentproperty.com.au, www.yourestate.com.au, www.dwelling.com.au and www.owner.com.au offer to list your property, and for various fees ranging from free to around $250, you can choose the type of listing you have.

Ideally, you will want to put up a good display of digital photographs and a well written description online. The private sale of an average priced ($600,000) Sydney home would save the seller about $16,500 in agent fees. Even on the sale of a $200,000 property the saving would be about $7000, so the idea is very tempting.

It also has benefits for the potential buyer who knows that the seller has more pricing flexibility thanks to the lack of agent fees.

As a buyer, the internet should be your first stop when looking for a house as most real estate agents have their own websites and you can pick out a selection of properties to look at before you visit any real estate office. ■



▲ You can save thousands by selling property privately, but make sure you are well prepared and ready to work at it.

ADVANTAGES

Potentials savings of many thousands of dollars. Internet listing has the potential to reach a national and international audience rather than just local buyers.

DISADVANTAGES

You have to do all the sales work yourself and there is no guarantee you will receive any response to your ads. If you do find a buyer you must be fully aware of all of the documentation and contractual requirements for the sale. Most buyers still prefer to go through licensed real estate agents who will actively sell your property.

HUNT AROUND

These are just a few of the ways you can use your computer to save money. There are many more for example next time you want to change your mobile phone plan go to www.phonechoice.com.au and compare all of the plans available; if you are looking for insurance try www.insurance-quote.com.au; and if you are looking to refinance your house, put money on term deposit or get a credit card go to www.infochoice.com.au. You can often find the best place to buy cheap fuel by checking on oil company websites or local sites such as www.fuelwatch.com.au in Western Australia. All will help you save money.

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NeoV OPTICAL FILTER

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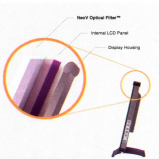
- Available in 15", 17", 19" and 20" (X only)

NeoV OPTICAL FILTER



The NeoV Optical Filter™ is a specially formulated, hardened, tempered, scratch resistant optical glass that is built on top of the internal LCD panel to dramatically enhance image quality and protect the screen from damage. The proprietary multi-coated optic filter delivers rich, vibrant colours and crystal clear image definition for ultimate clarity and reduced eye fatigue.

(NeoV received the "Best Innovation" award from PC Magazine in 2003).

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CELLNET GROUP

SPECIAL REPORT

Have your cache and eat it

What if your ISP could help you download faster and cheaper? **Simon Sharwood** wonders why caching is yet to catch on.

Imagine if your ISP had a way to make your downloads faster and cheaper. Now stop imagining and start scratching your head in a combination of wonder and bemusement, because the technology exists but many ISPs are increasingly reluctant to use it – an extraordinary state of affairs that inflates their coffers while hitting you in the hip pocket.

The technology that delivers faster, cheaper downloads is called caching and is all about storing web pages closer to your computer. Storing them closer is useful because every time you type a web address into your browser you set in motion a process that sees routers all over the planet direct your request to the server that hosts the web page.

If that page is hosted offshore, the data you want must travel all the way back to Australia over whatever links are available.

The performance of those links is highly variable. In the late 1990s, for example, the submarine cable connecting Alaska and Japan broke and as luck would have it, that cable was responsible for a fair amount of traffic to Australia. To restore service, Telstra quickly resorted to using satellites for a few weeks, a tactic which worked but added plenty of waiting time for web pages because the roundtrip to space and back adds a noticeable number of milliseconds to data transmission.

'Caches read codes embedded in pages that instruct them to go out onto the internet to retrieve fresh content.'

WHAT'S IN A CACHE?

Caching was designed to get around this and other internet congestion problems by removing the need for each and every request for a web page to go all the way to the server that hosts the content.

Caches come in two flavours: hardware and software. US company Network Appliance is the leading proponent of hardware caches and offers a range of big blue boxes crammed with disks, and caching smarts typically end up in the hands of ISPs.

Software caching is led by the open source program Squid, first released in 1996. Squid runs on many Unix variants and is often used on Linux alongside the Apache web server. Microsoft makes a cache too, but calls it a Proxy Server – another name for the same thing.

▲ Squid (www.squid-cache.org) is one of the most popular software caching tools around.

Hardware and software caches work by letting your ISP store content locally and intercepting your request before it goes offshore. So, instead of embarking on a mammoth round trip, the page is whipped out of a local cache. The short distance the data has to travel and speediness of the local disks means that your content only has to come from the ISPs cache farm and then down some relatively simple and unclouded local networks to reach your PC – a far simpler job than traversing the internet.

To boost performance further, caches read special codes embedded in web pages that instruct them when they should go all the way out onto the internet to retrieve fresh content. Caches can even pick apart a site to figure out which elements of the page need to be downloaded regularly and which need to be stored. For a page like *PC Authority* a good cache would figure out that the graphics on the front page hardly ever change and store them locally. The other content on the page like news stories and ads that do change would still be pulled in from the host server so that less data travels long distances.

The benefits of caching to end users are so obvious that some content providers pay a company called Akamai to cache their content for them so their users to have a good experience when they visit their web page. Akamai then installs caches at ISPs containing only its clients' content, so that end users get the fastest possible access.

The company's Senior Manager for Australasia, Ian Teague, says it maintains 300 servers in Australia alone and that its services are increasingly sought by content providers to support big net events like the release of movie trailers.

ISPs don't mind Akamai at all, because for the cost of running an extra server their customers get a better experience. ▶

Caches also benefit ISPs in other ways, because every time they serve you a page from their caches they don't have to pay for the bandwidth consumed going to wherever in the world the page lives. One download to the ISP's cache can therefore turn into hundreds or thousands of downloads for local customers, all with just one charge for the ISP.

'The benefits of caching to end users are so obvious that some content providers pay to cache their content so their users have a good experience when they visit their web page.'

END-USER BENEFITS?

For ISP customers on pay-per-megabyte plans this should sound alarm bells: why should you pay for metered downloads when the data is already in a cache, with the real cost of retrieving it already incurred? Worse still, why pay to download content Akamai has arranged to be stored in a cache?

Sydney ISP BigAir sees charging for cached content as justified because '... caching equipment is expensive and requires ongoing maintenance and management by qualified engineers. Any upstream network cost savings will contribute towards covering these costs, but normally they just about balance each other out,' according to the company's chairman Jason Ashton.

Other ISPs no longer cache because they believe there is now little cost saving to be made and little benefit to customers. 'Bandwidth is now so cheap that caching makes no sense,' says Stuart Marburg, general manager of Netspace. 'And now that the web is increasingly dynamic, caching has less of an impact.'

Greg Bader, the chief technology officer of ISP iiNet, agrees. 'We own our own Cisco and Network Appliance caches,' he says. 'We are struggling to see more than a 5 percent saving. Three or four years ago it was a 15 percent saving and at those prices that meant a lot of money. But now the cost of caches means it is not needed.'

BigPond also does not use web caches. 'It is generally understood that caching's main benefit is to reduce bandwidth costs,' a spokesperson told *PC Authority*. 'However this has to be compared against the increased network complexity, which can have negative impacts on support and engineering costs as well as availability and customer experience.'

Yet BigPond's position is at odds with that of Telstra Internet Direct, the arm of the company that resells internet connectivity to smaller ISPs.

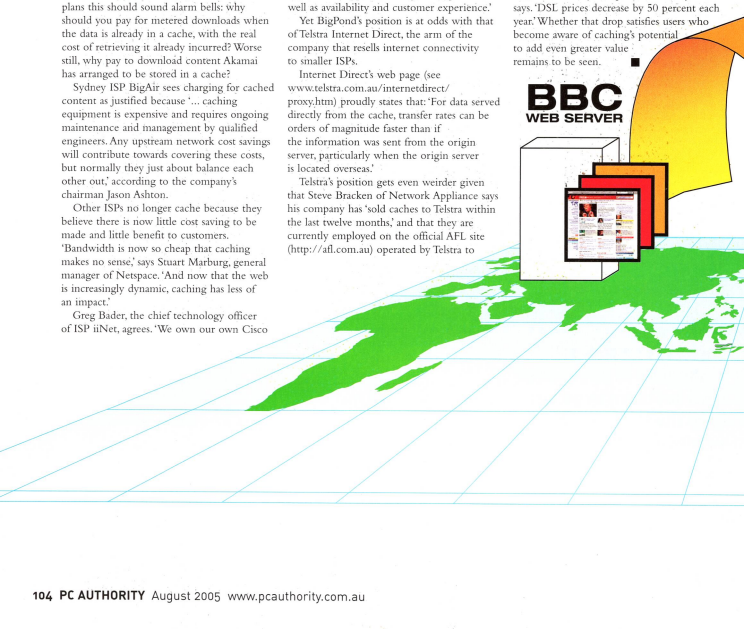
Internet Direct's web page (see www.telstra.com.au/internetdirect/proxy.htm) proudly states that: 'For data served directly from the cache, transfer rates can be orders of magnitude faster than if the information was sent from the origin server, particularly when the origin server is located overseas.'

Telstra's position gets even weirder given that Steve Bracken of Network Appliance says his company has 'sold caches to Telstra within the last twelve months,' and that they are currently employed on the official AFL site (http://afl.com.au) operated by Telstra to facilitate large numbers of simultaneous users accessing streaming video of AFL games.

Caches excel in this role because if a high volume site like the AFL's tried to satisfy all of their users they would quickly require a massive server with an even more massive connection to the net to satisfy demand. Caches let them spread the content and the computing and bandwidth loads to satisfy more users at lower cost.

And it is in this kind of role that caches may yet make a comeback. 'When video on demand and so on arrives over higher speed connections like 100Mb/s to the home, maybe we will have to look at caches again,' says Netspace's Marburg, as the sheer quantity of data users demand could again overwhelm network connections.

But in the interim, he does not feel that internet users should feel hard done by. 'We are in a very competitive industry,' he says. 'DSL prices decrease by 50 percent each year.' Whether that drop satisfies users who become aware of caching's potential to add even greater value remains to be seen. ■



CACHING 101

Even ISPs like Optus that offer an opt-in caching service don't let you specify what goes into the cache. But most caches are set up so that once a web page reaches Australia's shores, it will be cached.

The more you access your site, the more likely it is the cache will recognise that heavy traffic makes it worthwhile storing it locally. If your ISP offers a cache, chances are you will connect automatically. If you have any doubts, call their help desk.

Another way to take control of caching is to use your browser's built in cache, which stores content on your very own hard drive.

Turning on and using this cache is a relatively easy task. In Internet Explorer go the Tools menu, select Options and then click on the General tab. Click the Settings button and you'll see a new dialog box with a slider at the bottom. Move the slider to set the size of your cache and remember: bigger is better!

Next, turn your attention to the four radio buttons above the slider. Click on the one marked 'Automatically' and your browser will check the content in its cache every time you visit a site and retrieve only new material.

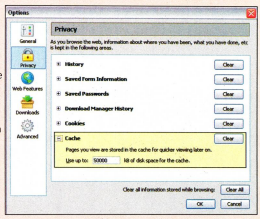
If you use Firefox, go the Tools menu, select Options and click on the Privacy icon. The last Privacy option on the right is for 'Cache.' Expand this option and type a number into the dialog to set the size of the cache on your PC.

A more adventurous approach is to learn the address of your ISP's cache and manually point your browser towards it.

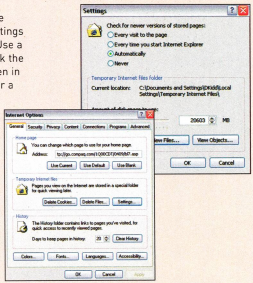
In Internet Explorer select Tools, Options and then click on the Connections tab. Click the LAN Settings button, then tick the box marked 'Use a proxy server for your LAN' and click the Advanced button. You'll see a screen in which you can enter the address for a HTTP proxy.

Do so and your browser will head to the cache to look for content before it heads anywhere else.

If this disrupts your browsing experience, simply undo these steps to cut the cache out of the loop.



▲ Firefox (above) and Internet Explorer (below) let you configure your cache settings.



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QUESTIONS & ANSWERS

David Moss fires up firewalls, sounds off about notifiers in Windows XP and resolves a stalling uninstall.

PANE RELIEF

Q Is there any way to turn off the Reading Pane in Outlook 2003 so that it never appears in any of my folders?
B Ramdin

▲ Use command-line switches with Outlook 2003 if you want to get rid of the Reading Pane on a permanent basis.

A There's a simple way to do this: create a new shortcut to Outlook (or modify an existing one) that starts it up with the </nopreview> switch at the end of the command line. This not only gets rid of the Reading Pane in all folders but drops the Reading Pane entry from the View menu too. As you've discovered, the only other way is to turn it off on a folder-by-folder basis, which is a royal pain, and I'm irritated that Microsoft provides no other solution that doesn't require a command-line switch (my guess is that because the Reading Pane is one of the plus points of Outlook 2003, the company couldn't believe that anyone would want to turn it off for every folder). I really like it and hate having to turn it off, but given the content of some messages these days I'd rather see only the subject line until some genuine spam solution can be found.

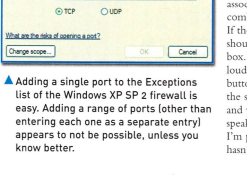
If, like me, you always start Outlook from the Quick Launch bar and so modify that shortcut, you'll discover that it has a </recycle> switch already applied. This makes sure that if you already have Outlook open and running, a new instance won't be created but the running copy is given focus on the Windows Desktop.

PORTS IN A STORM

Q Is there a way to configure a range of ports in the firewall that ships with Service Pack 2 for Windows XP?
T Baker

A If there is a way, I haven't found it. Setting up an exception for a single port is as easy as pie, but I can see no way to except a range of ports at the same time by changing a single entry, which is silly in my opinion. If someone understands how to add a range of port exceptions to the firewall, please drop me a line, as Mr Baker and I aren't alone in wanting to know how to do this.

I considered employing the Netsh command-line utility in firewall mode via one of its <portopening> parameters, but perusal of the documentation shows me that even this method allows only a single port to be entered at a time. Given that such a vast number of online applications, especially games, require a range of ports to be open, this becomes a great irritation. For example, World of Warcraft requires TCP ports 3724 and 6112 to be open, and recommends that the range 6881-6999 also be open for its downloader to work. Having to configure 118 ports one at a time is ludicrous, but that's what it seems you have to do. Personal experience tells me that for World of Warcraft, this port range 6881-6999 isn't optional, so if you use the Windows XP SP 2 firewall, prepare for a long session of setting port exceptions. Obviously, you could use a different firewall and, in fact, that's precisely what I do, using the firewall in my router, but I appreciate that this isn't always an option for everyone else.



▲ Adding a single port to the Exceptions list of the Windows XP SP 2 firewall is easy. Adding a range of ports (other than entering each one as a separate entry) appears to not be possible, unless you know better.

NO NOTIFIERS

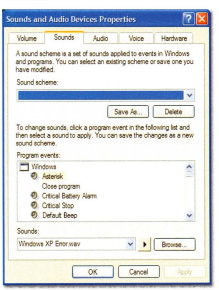
Q The notifiers that are installed as defaults with Windows XP have vanished. Any notifiers that I've installed separately, or as part of another program, work fine. I'm using Windows XP with SP 1 and 2, and Office XP.
C Jones

A There are a couple of things you should check on here. Go to Start, select Control Panel and then, if you're in Classic view, select Sounds and Audio Devices and go to the Sounds tab; if you're in Category view, select Sounds, Speech and Audio Devices and then click on the link labelled 'Change the sound scheme'. Look at the entry listed under Sound Scheme at the top of the dialog, and if this is set to 'No Sounds' click on the drop-down arrow at the right, select 'Windows Default' and then click OK, which should restore your sounds.

If the Sound Scheme combo box is blank, leave it a moment and carry on with the next step. Halfway down the Sounds window is a list of Program Events (these are what you're calling 'notifiers'). To check if an event has a sound associated with it, simply scroll down the list and note which events have loudspeaker icons next to their event title. If there's a loudspeaker, click on that event and you'll see the name of the sound associated with it appear in the Sounds combo box at the bottom of the dialog. If there's no loudspeaker, clicking on an event should show (None) in the Sounds combo box. With an event selected that has a loudspeaker icon, click on the Play Sound button, which you'll see located between the sound filename and the Browse button, and you should hear that sound in your speakers (since you can hear other sounds, I'm presuming your entire sound system hasn't been accidentally set to mute).

If you find that loudspeaker icons are missing from items you believe should have them, you can either assign sounds manually to an event via the Browse button or by clicking on the down-arrow on the Sounds combo box and selecting a sound from the long list that appears. Alternatively, simply go back to the Sound Scheme combo box, click on the down-arrow and select the 'Windows Default' sound scheme. The reason I didn't suggest this earlier is that if you'd already set up custom event sounds (or a program had done it for you), you might not have wanted to reset everything straight away, but it's the fastest way to ensure that you get all the sound events usually associated with Windows.

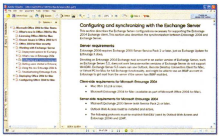
The Sound Scheme combo box on my system, for example, has no entry: my Sound Events have become modified over time, usually by additions placed there by third-party programs, and unless this modified Sound Scheme is saved with a specific name the entry in the combo box simply goes blank. I just checked four Windows XP boxes in this room and not one of them had an entry in the Sound Scheme combo box, so this isn't to be unexpected or seen as a sign of a fault.



▲ The lack of an entry in the Sound Scheme combo box list isn't a sign of a fault with Sound Events.

SYNC OF INIQUITY

Q I have a problem with Exchange Server, but strangely enough only on my Mac systems. I'm using Microsoft Entourage as the mail client, as it was easy to set up and connect to the Exchange server, but now it's driving me insane with its constant updating of folders with the Exchange server.



▲ Perusing the Microsoft Office 2004 for Mac Resource Kit, trying to see what the synchronisation issues are between Entourage and the Exchange server.

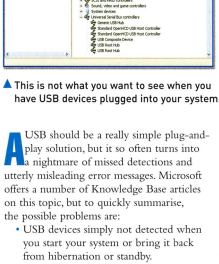
I've hunted everywhere for a way to stop this happening, but can't see one.
D Heal

A I too use Entourage on my Mac connected to an Exchange Server, and I could cheerfully throttle the product at times. It's a lovely-looking mail client, but I get a lot of mail, much of which is stored in subfolders under Inbox. I can't recall any time when it isn't synchronising itself with the Exchange server, because no sooner has it finished with the Inbox than it proceeds to do the same with all the subfolders. I've hunted for documentation on this issue, and I think the most telling statements come from the Microsoft Office 2004 for Mac Resource Kit. Here's an example: 'Latency occurs when Entourage communicates with the Exchange server. The synchronisation is not instantaneous, and the user cannot trigger it directly. Quitting Entourage or switching the Entourage identity will force the synchronisation of pending changes in Entourage to the server. Running the "send and receive all" schedule, or any other schedule, does not affect synchronisation.' Or this statement from the section describing how synchronisation settings are handled for Contacts and Calendar items: 'After a change is made locally, Entourage waits one minute before starting synchronisation. If the user makes another change, the one-minute countdown starts over. This schedule stops Entourage from starting multiple instances of synchronisation too frequently when the user edits multiple records.'

Therefore, if you have a large Inbox and multiple subfolders also with large numbers of messages, Entourage never gets to finish synchronising, which isn't a good thing at all. It increases network traffic, but this also means that the Inbox doesn't get refreshed nearly as often as you might wish. My solution has been to simply quit Entourage and start it again, as I know at that point it will update the Inbox first. Why this program fails to function the same way as Outlook does in the same situation is quite beyond me.

USB HICCUPS

Q I have a problem with my new keyboard and mouse. They're both USB devices and, while the keyboard seems fine, the mouse isn't, with the system sometimes seeming to lock up when the mouse is moved.
D Marshall



▲ This is not what you want to see when you have USB devices plugged into your system.

A USB should be a really simple plug-and-play solution, but it so often turns into a nightmare of missed detections and utterly misleading error messages. Microsoft offers a number of Knowledge Base articles on this topic, but to quickly summarise, the possible problems are:

- USB devices simply not detected when you start your system or bring it back from hibernation or standby.
- CPU utilisation goes to 100 percent when you move a USB mouse.
- Computer hangs when you resume from standby if you have a USB mouse connected.
- Computer takes a long time to start or resume when a USB device is connected.
- USB 2 Hi-Speed devices detected as USB 1.1 devices when your computer resumes from hibernation, even if plugged into a USB 2 port.
- Yellow exclamation marks with Code 28 or Code 31 appear on USB devices in Device Manager.

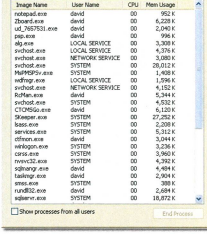
Microsoft is researching these issues and will update the articles when there's more information. At least it acknowledges there's a problem, and to be fair I suspect the issue lies with the hardware manufacturers as well.

I actually have a system with two keyboards plugged in, one in its PS/2 port and the other in a USB port, which is the only way I can ▶

get the USB keyboard to work. It's a specialist keyboard that I need for certain functions, and it took some time before I thought to test whether both keyboards could happily co-exist. My suggestion for you would be to switch to a PS/2 mouse until a solution is found, although I've noticed that some USB devices are better than others at being recognised by Windows.

I purchased one USB keyboard and mouse that Windows adamantly refused to notice, but when I tried a different set all was fine. I've also found that mixing and matching USB keyboards and mice from different manufacturers can cause problems.

I haven't even touched on the nightmare that is Windows' reaction to inserting a USB hard disk device and having it grab the drive letter used by some network share so that share is no longer available. Get around this by mapping network shares to high letters, leaving drives below H to the mercy of the operating system and plug-in devices.



▲ Task Manager lost some of its bits? The solution is just a double-click away.

WHERE'S MY TITLEBAR?

Q When I start Task Manager in Windows XP Pro SP 2, the only screen I see is the one attached. I don't see any menu bar or options to show running applications, CPU performance and the rest. It's very annoying and I don't seem to be able to get the usual version back. I guess it must be some key combination or Registry key that 'minimised' the view I see, but I can't undo it. I have to press Esc to close the screen.
G Lambert

A To restore the Task Manager window to its usual display complete with menu, tabs and titlebar, simply double-click on any part of the border of the minimal display window. If you ever want the minimal view back again, double-click in the blank area to the right of the tabs.

ADOBE DON'T

Q I tried to load Adobe Reader 7 (I had Adobe Reader 6 working) onto my computer, but it failed, citing: Error 1316, problem with Adobe Reader 6.0.1.msi. I've tried everything. I reloaded SP 2, tried different sources of Adobe 6 and 7, and spoke to Adobe people for more than two hours on the phone. This occurred about the same time I changed to broadband (wireless), so I'm not sure if that has caused the problem. Adobe recommends I reformat or use System Restore to take it back to before the problem time. I don't want to do this unless it's absolutely necessary. I can get Adobe 5 to work, but not 6 or 7.
R Walters

A I haven't come across this problem before, but I did find a lengthy Adobe support document that just might provide the solution to your problem at www.adobe.com/support/techdocs/329444.html

CLOCKED OFF

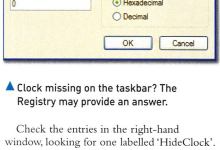
Q I run Windows XP updated to Service Pack 2, and recently the time and date has disappeared. I've checked the Control Panel and it's fine, but when I check the properties of the Start bar, the box to tick to display the clock is greyed out. Any ideas on how to rectify this problem?
J Turner

DAVID'S TIPS: MICROSOFT ANTISPYWARE BETA

Many people have been trying out Microsoft's anti-spyware software, available as a free download from the Microsoft website. I've had a few emails on the subject, and most of them were regarding problems involving the Windows Firewall and/or Internet Connection Sharing (ICS). There were also networking issues and one that had IE coming up with 'Error 404: Page cannot be displayed' messages. Microsoft clearly states that it won't provide formal support for beta products, and a lot of people have assumed that this means any support. In fact, this isn't always the case, and Microsoft has posted a Knowledge Base article that deals with the errors mentioned above. The problem seems to lie in the fact that many spyware applications place entities called Layered Service Providers (LSPs) on your system and use them to gather data; when Windows AntiSpyware goes to work, it savages these LSPs, but doesn't restore them once it's removed any spyware. This has unfortunate effects on the Winsock LSP chain. Winsock is an Application Programming Interface (API) that enables Windows programs to use transport protocols such as TCP (Transmission Control Protocol). Some legitimate programs insert optional LSPs between Winsock and the underlying protocol stack, and they always chain such LSPs so that all programs can access them. Microsoft AntiSpyware's action with regard to LSPs could, in this particular case, be deemed less than helpful. Microsoft has a Knowledge Base article that explains how to rebuild the Winsock LSP chain. You can find it at http://support.microsoft.com/?scid=892350

A Some tweak programs for Windows XP can reset this and indeed cause the clock to vanish, but the quickest way to resolve it is a trip to the Windows Registry. Make sure you back up first, then head to Start, select Run, type regedit into the edit box and hit Enter. When the Registry Editor opens, look for the following key:

```
HKEY_CURRENT_USER\Software\
Microsoft\Windows\CurrentVersion\
Policies\Explorer
```



▲ Clock missing on the taskbar? The Registry may provide an answer.

Check the entries in the right-hand window, looking for one labelled 'HideClock'. If it isn't there, you'll have to create it, although I suspect it will be there given what you've said.

If you do need to create it, right-click, select New and then DWORD value. Name the new value HideClock and set its value to 1 to display the clock.

If the entry does already exist, double-click it and change the value from 0 to 1 to restore the clock to the System Tray. ■

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HOW TO INSTALL A TV TUNER

Make the move to digital TV and kiss the VCR good-bye. **Robert Stanley** shows you how to install a TV tuner.

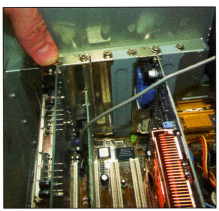
Digital TV has been available in Australia since the start of 2001, and set-top boxes and televisions are starting to pick up sales. For any TV aficionado, the benefits over conventional analogue broadcasting are obvious: digital TV offers clearer images (as it's not subject to interference), better sound (surround-sound standards are supported), and more channels. Multichanneling allows non-commercial Australian networks to broadcast several at once. This is limited to ABC and SBS, though: commercial channels are legally allowed to show alternate angles of sporting events, for instance, but they can't offer entirely separate content on their secondary channels.

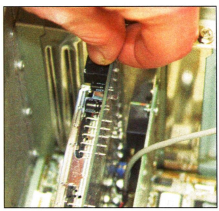
Digital TV can be received on your computer by fitting a digital TV tuner card to your PC. These cards start at less than $130 and, in conjunction with personal video recorder (PVR) software, offer the user the ability to pause / fast-forward / rewind live television or record shows directly to the hard disk (where they can later be archived off to CD or DVD).

▲ Ensure that you opt for a popular TV Tuner card like Hauppauge's WinTV PVR models to maximize software compatibility.

DECISIONS, DECISIONS

Before jumping the gun, the first choice to make is whether or not you want to go for an analogue or digital tuner. There are very few reasons to opt for analogue these days, unless you live in a regional area without a range of digital channels to choose from. Standard definition (SD) digital will give you the best selection of channels in most areas, and if you live in Sydney or Melbourne, you may even want to consider a High Definition (HD) version. HD offers superior image quality to SD, but be warned that not every network (or show) is broadcast in HD. For more information on what's in HD (as well as coverage maps for digital TV in Australia), check www.dba.org.au.





▲ Installing a PCI-based TV Tuner card is a simple matter of popping the case, finding a spare PCI slot, and slotting the card in place.

Note that both digital and analogue models can't be used to record satellite television broadcasts. If that's your goal, you'll need to pick up a dedicated DVB-S card, which is designed specifically for satellite transmissions.

After sussing out what you're actually after, the next question is whether to opt for an internal or external tuner. Notebook users will require an external model, but these models generally carry a $50 price premium over internal models, and demand a USB 2.0 port. The added expense is often not worthwhile for desktop users, as PCI models are much more common and are therefore better supported. If you're confident in opening your computer, there's little reason not to pick up a PCI model. *PC Authority* recommends the ATI, Hauppauge, and AverTV branded cards, simply because they're popular choices that are well supported by software. A non-standard card can be extremely tricky to get working properly.

INSTALLING THE HARDWARE

As mentioned, the process of installing an external TV tuner couldn't be simpler: find a spare USB 2.0 port on the rear of your machine and plug it in.

Fitting an internal PCI model is a little fiddlier, but still straightforward for anyone comfortable with opening their PC. Start out by disconnecting your PC from mains power and unplugging any peripheral devices like monitors, keyboards, mice, or printers. Remove the case screws and slide your computer's case off. Locate a spare PCI slot and unwind the slot cover screw before removing the cover. Gently push the PCI card into place and secure by replacing the slot cover screw. Replace the computer's case, and re-connect the peripherals and power cord.

You'll be asked for a driver disc next time you boot Windows, and after the drivers are installed, you're free to install your PVR of choice.

SOFTWARE CONSIDERATIONS

After successfully installing the hardware, the next step is to consider software to drive it.

CASE LOGIC

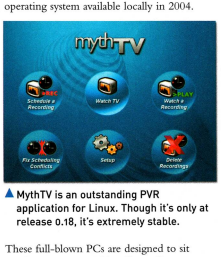
Small form factor boxes make fantastic HTPCs thanks to their lounge room-friendly styling and small footprint. There's ample room in most to install a large hard disk, TV tuner and optical drive. So if the idea of building an entire PC from scratch gives you the willies, *PC Authority* recommends opting for a barebones box from vendors such as:

- **www.shuttle.com**
- **www.asus.com.au**
- **www.msicomputer.com.au**
- **www.soltek.com.tw**

▲ Cyberlink PowerVCR II is a solid, stable PVR that can be used to watch, schedule and timeshift TV.

Most hardware comes bundled with a basic PVR application that enables you to watch live TV, pause and timeshift during playback, and schedule recordings. Solid software offerings also incorporate EPG information that enables you to schedule based on what's actually on TV instead of relying on time, but getting these working in Australia can be a chore.

Home theatre PCs (HTPCs) have become relatively popular since Microsoft made its Windows XP Media Center Edition 2005 operating system available locally in 2004.



▲ MythTV is an outstanding PVR application for Linux. Though it's only at release 0.18, it's extremely stable.

These full-blown PCs are designed to sit in a lounge room and handle media content: video, photos, music and live TV.

As such, they're generally skinned with themes that are viewable from several metres away. Several programs are available to sit atop Windows XP or 2000, though, including Cyberlink PowerVCR, II 3 and ShowShifter 3.12. PowerVCR, II (www.gocyberlink.com to download a 30-day trial), and ShowShifter 3.12 (a 15-day trial is available at www.showshifter.com) feature a slightly different layout to Media Center, but work well. Both applications feature full PVR capabilities along with network support.

Both applications can be downloaded from their respective websites, and with a few clicks you can be watching digital TV in no time.

Linux users will also want to check out MythTV (www.mythtv.org). Despite the fact that the software is only at version 0.18, it's solid, relatively stable, and feature-rich.

▲ ShowShifter offers a simple, elegant interface for those looking to schedule recordings, or playback other media.

WINDOWS XP MEDIA CENTER EDTION 2005

The all-out option is to go the full Windows XP Media Center Edition 2005 route. Media Center Edition 2005 is a full-blown operating system built on Windows XP home, but it's still a good (though somewhat costly) choice for anyone wanting to watch and record TV.

Some online stores, like www.auspcmarket.com.au for example, are offering TV tuner cards, Windows XP MCE 2005, and remote controls, but the trio will set you back several hundred dollars in total.

Windows XP MCE 2005 is extremely picky about the type of TV tuners that will work with the OS, so make sure that your hardware is supported if you're hunting down a copy to work with your existing setup. Check with your hardware provider to ensure you can get a hold of appropriate BDM (Broadcast Driver Model) drivers to work with Windows XP MCE 2005.

Windows XP Media Center Edition 2005 misses some of the advanced features found in Windows XP Professional. This isn't an issue if you're running a small home network, but it excludes the PC from joining a wider domain – a concern if you're running the machine in an office network or even some university networks.

Another downside to using Windows XP MCE 2005 is that the OS records TV shows in a proprietary format instead of a standard MPEG-2 stream. This means it can't be played-back by standard software, which may be an issue if you're going to use more than one computer in the foreseeable future.

GET SMART

As always, it pays to do a little research before diving in and committing to a purchase. If you're keen on getting into digital TV on your PC, spend some time surfing. You may want to start by checking out the following sites:

www.dba.org.au: Digital Broadcasting Australia: Get information on the status of Australian Digital terrestrial television straight from the horses' mouth.

www.dtvforum.info: Need some help when things go pear-shaped? Log onto this handy forum for lots of tips and tricks on configuring and working with digital TV.

www.epgrunner.net: Setting up an EPG for Australia is a tricky task. Check this site out to import an XML EPG data into Windows XP Media Center Edition 2005.

www.ebroadcast.com.au/tv: Don't want to bother with an EPG? Use this site for regular web updates of what's on.

ELECTRONIC PROGRAMME GUIDE

One of the key components that helps make digital TV so compelling is the availability of Electronic Programme Guides (EPGs). Unfortunately, the Australian networks are hesitant to let this information out freely, and it's still a little tricky to get an EPG up and running in Australia. Channel information is broadcast on the digital channels, but IceTV (www.icetv.com.au) offers commercial guides ($3 per week for updates, though a week-long trial is also available). Anyone looking to schedule recordings at a PC should check out www.ebroadcast.com.au/tv/, as it provides website listings of TV guides.

One of the reasons cited for Microsoft's delay in releasing Windows XP MCE 2005 to the Aussie market was the lack of a local EPG. Work has been done to get around this issue, though. Check www.xpmediacentre.com.au for information on getting EPG information working with Windows XP MCE 2005. Alternately, try EPGRunner (www.epgrunner.net) for an application designed to import XML EPGs into the OS. It will even work with IceTV (www.icetv.com.au).

As you can tell, getting a digital TV tuner up and running in Australia requires a little bit of behind-the-scenes knowledge and troubleshooting.

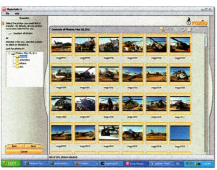
With a little effort, it's worthwhile, though: the days of manually programming that VCR are long-gone.

GET STARTED WITH PHOTOSUITE

Want more control over your photo library? Leigh Dyer takes Roxio's PhotoSuite for a spin.

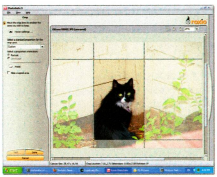
Digital imaging is all the rage these days, and the Roxio PhotoSuite software on this month's CD lets you organise your digital images, fixing up those annoying little flaws and cropping them to standard photo sizes. Sharing digital images with PC-fearing friends can still be a problem, but PhotoSuite has a neat solution – burning your images to a VideoCD slideshow, ready to play in a DVD player. After installing the PhotoSuite software, follow these steps to make and burn your slideshow to disc:

1 Import your photos in to PhotoSuite. Open PhotoSuite, click on the Transfer button on the left, and select Transfer from new device. You can import images from hard drives, CDs and DVDs, and digital cameras or flash card readers. Select the device on the left and hit Next. Then, navigate through the folders on the left to find your images. Select the images to import, and hit Next. To complete the transfer, enter a name for your album and hit Transfer.



▲ PhotoSuite lets you import and organise your photos.

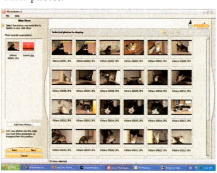
2 Edit your imported images. Click on Edit & Create, then on Edit, and select an image file to open. A few basic image operations are listed on left of screen. To reveal more, click on the Show All Features button. The PhotoDoctor option tries to automatically correct the brightness and colour balance, but it often seems to do more harm than good, so let's stick to the manual adjustments. Under Overall Quality, select the Exposure tool and click the More Settings button to reveal the manual sliders – a little tweaking here can really liven up an otherwise dull



▲ Simple cropping and editing is easy.

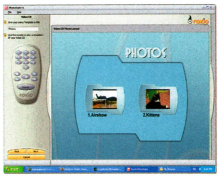
image. Other handy tools include the Red eye tool under Facial Flaws, and the Crop and Rotate tools under Transform.

If you want to get more creative, try the Effects tools, which can apply all sorts of artistic special effects to your image, or use the Add Photos tools to add extra elements to your image. You can include objects from PhotoSuite's built-in selection, or use the Create Cutout tool to cut elements out of other photos.



▲ Convert your images in to slide shows ready to burn to disc.

3 Create a slide show. Click on Print & Share, and then on Slide Show. Select the Create a new slide show button and hit Next. To add the photos, click on 'Add More Photos...' and select the images to add in the album browser, and then click Next. Edit the slide duration time if you'd like the images to stay on screen for more than 5 seconds each. If you'd like to have music playing during your slide show, click the Browse button and select a music file. Hit Next to create the slide slow and reveal the options to save and preview it.



▲ Burn your slide shows to a VideoCD for playing in DVD players.

4 After creating a few slide shows, click on Print & Share and then on Video CD. Select the 'Create using existing slide shows' option and click Next, then select a template to use for your VideoCD menus and click 'Next' again.

Select the slide shows to add from the list of recent files on the left, or click Add More Slide Shows to open others. Arrange the slide shows in to the order you'd like them played in on the right, and click Next twice. Enter a title for your VideoCD, and take it for a spin using the virtual remote control. Hit Next if you're happy with everything, and then click on Video CD Options, where you can choose to include the original images and a PC slideshow on the CD as well.

To begin the burn, hit Record. Encoding your images in to VideoCD format can take a few minutes, but before long you should be presented with the CD burning dialog. Select your CD burner and appprpriate options, and hit OK.

JARGON: VIDEOCD

VideoCD, as the name suggests, is a format that stores compressed video on to regular CDs. VideoCD never really caught on for video distribution, and was quickly replaced by DVD, with their greater length and far better quality. However, VideoCD discs can be burned by standard CD burners and read by most DVD players, making them perfect for less demanding tasks like image slide shows or home movies.

MEDIA CENTER SYSTEMS BY EMAGEN

EMAGEN Media Center systems have been designed for the home theatre enthusiast who wants a top quality unit with a wide range of connection options for audio and video all wrapped in a sleek package to suit any decor.

All Emagen DHS media center systems come with an extensive range of input and output options including digital output for connection to a home theatre amplifier, S-Video, Component Video and DVI output, S-Video input and support for digital TV.

DHS M200

The DHS M200 is designed for users who need a slim case profile. This unit can support upto 2 tuners and 2 hard drives.

AMD Athlon 64 3000+
MSI RS480M2 Motherboard
512GB PC3200 DDR SDRAM
Integrated ATI X300 Graphics
DVico DVB-T Lite Digital Tuner
160GB 7200rpm SATA HDD 8MB Cache
16X Dual Layer DVD+/-RW Drive
240W ATX Power Supply
10/100 LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

$1,449 Inc GST $15.23 p/wk*

DHS M400

Packed with the latest technology, with plenty of room to add extra storage or optical drives, and extensive support for video input and output to suit any requirement.

AMD Athlon 64 3000+
Asus A8V-E Deluxe Motherboard
512MB PC3200 DDR SDRAM
128MB GeForce 6200 TC HDTV/DVI
Dual DVico DVT-T Plus Digital tuner
250GB 7200rpm SATA HDD
16X Dual Layer DVD+/-RW Drive
350W ATX Silent Power Supply
GbE LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

$2,099 Inc GST $22.15 p/wk*

VITESSE MCE

The Vitesse MCE provides a complete digital entertainment solution for those who want a normal PC integrated with Media Center.

AMD Athlon 64 3200+
Asus A8V-E Deluxe Motherboard
1GB PC3200 DDR SDRAM
128MB GeForce 6600GT HDTV/DVI
19" TFT 1280x1024, DVI
DVico DVT-T Plus Digital tuner
250GB 7200rpm SATA HDD
16X Dual Layer DVD+/-RW Drive
GbE LAN, Firewire, SATA RAID
7.1 Channel Audio, Digital Out
Logitech LX500 Wireless Desktop
Microsoft Media Center Remote
Windows XP Media Center 2005
1 Year Onsite Warranty

$2,479 Inc GST $26.08 p/wk*

Find out more about our complete range at **www.emagen.com.au** or call us on **1300 880 070.**

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make your world go faster >

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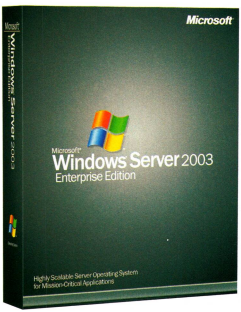
DRUNK AND UNPATCHED

Jon Honeyball takes a look at Windows Server 2003's first service pack and concludes that you needn't rush.

So Windows Server 2003 SP 1 has finally been launched. It's a strange thing, waiting this long for a service pack, especially for those of us who remember the heady days of quarterly patches. From a beta-testing point of view, this code has been flogged to death by the usual core teams and stands up to examination very well. In fact, the quality of Server 2003 overall has been excellent – the old mantra about waiting for SP 1 before deploying a product has proved unnecessary with Server 2003, which is a relief given the timescales involved.

SP 1 isn't a major release – it displays the same way of thinking as XP SP 2 did for the average sysadmin – and I can see many people hanging fire with SP 1 until the R2 release comes forth towards the end of this year or the beginning of next. If you think of SP 1 in the same terms as SP 2 for XP, you'll be in the right area. It's a large collection of bug fixes, plus an opportunity to tighten up on security sessions. Should you rush out and install it today? I'd say no, because, unlike Windows XP, Server 2003 tends to be deployed in less vulnerable situations (although that's a statement I can all too easily imagine coming back to bite me on the bottom!). Service packs for servers need more care, more planning and proper consideration before you attempt to perform any sort of upgrade, since so many people will be affected if the upgrade fails. It can really unmake your day to be called at midnight by someone who's just done an upgrade that didn't work properly and is fumbling for escape routes back to a working system because the box won't boot at all now.

As always, the maxim 'measure twice and cut once' applies. Plan everything in advance, make sure your backups are up-to-date and can be fully trusted, and then do the upgrade at a convenient time. Saturday 8am is normally a good time to start in most businesses, but only if you haven't drunk too much the night before. And that's not a joke, it's a real problem. I've watched still-mildly-inebriated and panicky sysadmins make things so much worse because of overindulgence the night before.



Windows Server 2003 receives new updates with its own SP 1.

SLIPSTREAMING IN A RELEASE

One of the first things you'll want to do with the Server 2003 Service Pack – or, indeed, with your desktop XP and SP 2 – is roll it into your installation tree so that you now have an SP 1'd Server 2003 install CD (or an SP 2'd XP installation). Although this functionality was promised in the days of Windows 2000, not many people took advantage of it, but now it's quite easy to do and anyone can create their own new setup files.

First, collect together the necessary starting components. Let's take XP as an example. You need to copy the contents of the XP install CD into a hard disk directory, which we'll call c:\myxp, for example. Then, it's necessary to get hold of the full version of SP 2 if you want to make a new SP 2 slipstreamed installation point. This isn't the stuff you get from the standard Windows Update; you need the complete SP 2 installation set, which is nearly 300MB in size from www.microsoft.com/downloads/details.aspx?FamilyId=049C9DBE-3B8E-4F30-8245-9E368D3CDB5A&displaylang=en.

The filename you'll get is windowsxp-kb835935-sp2-enu.exe, which weighs in at some 272,391KB. Let's rename this to mysp2.exe just to save my typing fingers, then drop the file into another directory on your hard disk – c:\mysp2 will do fine. Once you've done this, you'll need to merge these two directories together. To do this, open up a Command Prompt (say by choosing Start | Run and typing CMD) and navigate yourself to your c:\mysp2 directory. You then need to execute the package, but giving it special instructions on where to merge itself into, so type:

```
mysp2.exe /integrate:c:\myxp
```

That /integrate switch tells the setup program to merge itself into the installation tree held in c:\myxp. Once the unpacking has completed, the main part of the work has been done and the installation tree is now SP 2'd ready for an installation. However, you might want to integrate in some hotfixes too, which can be done by using the /integrate: switch on the hotfix.exe that you download from Microsoft (this will also patch the main tree for you). Just repeat it for each hotfix you want to integrate into the installation tree.

But that's not all. Let's say you'd like to make the installation auto-activate too.

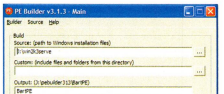
Microsoft
Windows XP Service Pack 2 Network Installation Package for IT Professionals and Developers
Download Center Home
Download Categories
Games
DirectX
Security
Windows Security & Updates
Internet Explorer Web Services
Drivers
Office and Home Applications
Media Services
Macintosh & Other Platforms
Server Applications
System Management Server
Windows Mobile
Development Resources
Developer Center Home
Related Download Sites
Search Microsoft.com
Customer Notifications
Worldwide Downloads
Windows XP
Windows Genuine Advantage
Get Genuine Windows
Windows Update
Microsoft Update
Windows Server 2003
Windows Server 2003 R2
Windows Server 2003 with SP1
Windows Server 2003 R2 Enterprise Edition
Windows Server 2003 R2 Standard Edition
Windows Server 2003 R2 Datacenter Edition
Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2 Standard x64 Edition
Windows Server 2003 R2 Datacenter x64 Edition
Windows Server 2003 R2 Enterprise Edition for Itanium-based Systems
Windows Server 2003 R2 Datacenter Edition for Itanium-based Systems
Windows Server 2003 R2 Standard Edition
Windows Server 2003 R2 Datacenter Edition

Just add the line AutoActive=YES to the [Unattend] section of the winnt.sif file, which is the unattended installation control file. But, you cry, where do I get one of those from? Well, there's a number of ways, but the easiest is if you extract setupmgr.exe from Support\Tools\Deploy.cab. Run the setupmgr program and fill in the questions and this will create the winnt.sif file for you.

If, instead, you're wanting to make a patched recovery CD for a machine that already has an installation of XP on it, you can grab the file from the system32 directory of your existing machine and copy it into the OEM\$$\system32 directory in your Windows setup source. This works only if the machine you're installing onto is identical to the one used to initially create the wpa.dbl file; otherwise, it will fail the checksumming of the machine, which forms part-and-parcel of the activation system. If you want to make a bootable disk from this installation, some more work needs to be done. However, a lot of this will depend on the CD-burning software you use, and there are some excellent tutorials on the web that show how to do this task using leading software packages such as Nero.

What's important here is that it isn't necessary to rely upon having an original XP CD and then go round patching every machine to bring it up to SP 2, and then keep patching further for post-SP 2 updates. You can easily create and update an installation point on a server and then distribute this version out to your machines. There are endless examples of how this can save huge amounts of time – in a classroom environment, for example, where each machine is identical and it's necessary to blow away the machines as a group every so often. A little bit of learning about how the update and integrate functions work will save hours of time later on.

'To go to a dead machine and boot it up into something that looks like Windows is a significant capability.'



▲ There are lots of add-ons you can drop into PE Builder too, depending on the functionality you want.

BARTPE

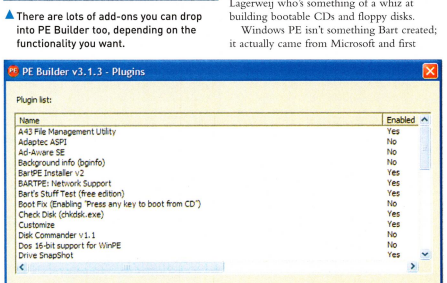
Another way of handling this is called Window PE (Preinstalled Environment), which you can create from your Windows XP or Server 2003 CD. The best-known version of this is BartPE (www.nu2.nu/pebuilder), named after its author Bart Lagerweij who's something of a whiz at building bootable CDs and floppy disks.

Windows PE isn't something Bart created; it actually came from Microsoft and first appeared around 2002. You might already have come across some applications, especially disk-partitioning tools or Ghost-alike disk imagers, that you boot from a CD. After a while of booting, you appear to get a full Windows environment, except it's booted from the CD rather than from the hard disk. This is PE, and it so intrigued Bart that he set about creating a tool that allows you to make your own PE disks. BartPE is the tool he created.

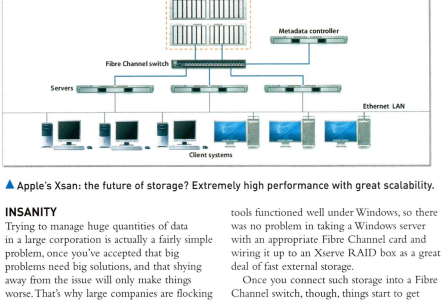
The advantage of booting from a CD image of Windows should be obvious: it gives you the full power of Windows, including all the device drivers, so you can access FireWire devices, work with NTFS and even attach yourself into really driver-dependent technologies such as a SAN. Although Microsoft has made a full PE kit available, the licensing for it is extremely restrictive and basically excludes the likes of you and me. But BartPE reuses the software you've already licensed on your XP or Windows 2003 disk to make a PE environment that's fully legal. If you have the OEM or Enterprise licence from Microsoft, you'll have access to the PE technology, but it's still a fairly limited implementation of what you can do with the PE environment, so you should be looking at using Bart's tool anyway.

So how difficult is it to use? The answer is it's extremely easy. Just download BartPE Builder and install it, then run it and it will ask you for the source path to your original Windows setup CD. Having done this, choose 'Create ISO image and Burn to CD' and press the Build button, whereupon PE Builder will create the PE environment. Once this is done, you can reboot the machine from the CD and away you go. There's a whole heap of plug-ins you can use with BartPE, as many developers have used it as a platform on which to build useful add-ons.

Obviously, this is a hugely powerful tool to have in your toolkit. To be able to go to a dead or wobbly machine and boot it up into something that looks pretty much like Windows – with all the networking and file-system support – is a significant capability, and there are numerous occasions where it will make the difference between a minor annoyance and a full-blown disaster-recovery session. Recommendation is mandatory, but do remember to send Bart a donation via PayPal for his hard work. ▶



▲ BartPE Builder: make your own bootable and hosted CD for Windows - a godsend in a disaster recovery situation.



▲ Apple's Xsan: the future of storage? Extremely high performance with great scalability.

INSANITY

Trying to manage huge quantities of data in a large corporation is actually a fairly simple problem, once you've accepted that big problems need big solutions, and that shying away from the issue will only make things worse. That's why large companies are flocking to solutions from companies such as NetApp or EMC. They want to have everything kept in one huge 'bitbucket', so that anything that isn't stored in there isn't of value. It's this focus and clarity that can be worth its weight in gold.

Of course, you have to have a solution that supports all the various data types and applications in your organisation, and it's here that simple NAS (Network Attached Storage) falls down. This tends to work fine for standard file-system files, but usually can't cope with active database engines such as SQL Server, Oracle or Exchange Server, and given that much of the business-critical information is nowadays held in such active storage engines, you can see that one's interest in NAS could tarnish quite quickly. Worse still, NAS solutions tend to be closed boxes, so adding more of them to the network doesn't create a larger puddle of data storage, it merely creates more puddles. So simplicity goes out of the window and you're back to a solution that looks like the directly attached server storage you were trying so hard to leave behind. Due to this, some NAS providers are trying to sell products that can start life as a NAS box and then be upgraded to become components in a SAN.

Last year, I took a look at the Xserve RAID box from Apple. This 14-disk SAN solution is disk engineering at its highest quality and makes the old 'let's just shove another disk in the server' seem rather laughable. At that time, Apple was working on getting Xserve RAID certified for platforms other than its own hardware running its own OS X, which employs a Unix-based GUI. I tried it at the time and found it worked fine. Performance was excellent and the Java-based management tools functioned well under Windows, so there was no problem in taking a Windows server with an appropriate Fibre Channel card and wiring it up to an Xserve RAID box as a great deal of fast external storage.

Once you connect such storage into a Fibre Channel switch, though, things start to get more exciting. Suddenly, you can have multiple servers or workstations accessing the same central pool of storage, but to make this work you need to chop up your SAN storage pool into clumps and give each server one or more clumps. Data held in one clump can't be seen by another box. Obviously, what was needed was some level of abstraction placed in front of the storage layer, and with Xsan Apple has delivered just this. Xsan allows you to take all your storage, drop it into one big pool and have every machine see the whole pool. As you add more storage, it joins the existing pool; there's no need to resize anything, it just adds more space. And the tools for managing the space allocation are highly impressive.

'Once you connect such storage into a Fibre Channel switch, though, things start to get more exciting.'

Let's say you want to set up a super-fast area of disk. Take two disks out of the arrays and set them up in striping mode, which gives you a clump of storage that's super-quick. You'll then want to join it back into the pool so that it's part of the big file-system puddle, which is easy – just create a subdirectory in your storage pool and set its 'affinity' to this area of storage you've just created. You could name the subdirectory 'superquick' if you liked, and anything written or read from that subdirectory would come from the disk-striped part of the storage pool. Obviously, if you overfill the capacity of the striped area, subsequent data will overspill into other areas that might be more tuned for reliability and redundancy, but it's a great solution for scratch data-processing space used by operations that are highly disk intensive.

To control access, there's a metadata controller that's an Xserve box running the Xsan software in that mode. This controls access to all the file storage and acts as a big lock server. As you'd expect, this is a critical component for the reliable running of the SAN itself, so it's good to see that it supports almost instant hot fail-over to another box. I set up a SAN network with two metadata controllers (one live, one in standby) and initiated a big file copy. I then turned off the power on the live metadata controller, and within a second or so the standby machine had come to life and taken over the role.

Of course, everything I've just described is running on the Apple hardware under its OS X, which might not seem particularly relevant to the Windows world. However, there are third-party Xsan interface drivers for Windows and other platforms available, so you can have an Xsan solution acting as the core backbone for an existing Windows Server network.

I'm very excited by this technology: indeed, I took time out from my meetings at Apple Paris to sit down with the head-honchos of Apple's server hardware and software business. I've told them that I want to see a 'mini-SAN' storage box that takes their excellent hot-plug hard disk solution. This could be connected via Fibre Channel into local machines or servers, and once you had a few of these you might buy a Fibre Channel switch and move all your storage onto the SAN fabric. Then you could put Xsan software onto all your Macs and Windows servers and clients, and share out one storage pool in a managed and reliable fashion. There were twinkles in the eyes of the people concerned and I hope they have the guts to do this. There's no reason why such high-end SAN solutions shouldn't be mainstream priced, and Apple is uniquely positioned to bring this technology to market, both for its own customers and also for the mainstream Windows world. I really want this – now. ■

JON HONEYBALL
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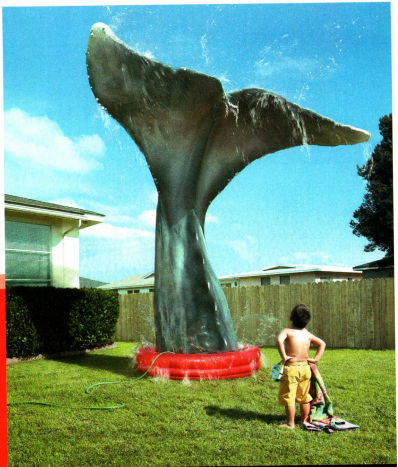

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SUNDAY DRIVING

Leigh Dyer moves his Linux system to a shiny new SATA hard drive.

Regardless of how much storage you have, it's never enough, especially with all the media we seem to store on our PCs these days. When I built my new Athlon 64 box at the start of the year, I had a spare drive handy so I didn't bother to get a new one, but when I filled it the other day, I ran out and grabbed a nice Seagate 160GB SATA drive. Installing a new drive would usually be a major hassle, with a new OS install and such, but it's really not that tricky to transfer your existing Linux system over to a new drive.

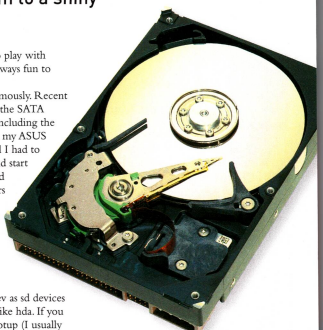
Besides, I hadn't had a chance to play with SATA at home before, and it's always fun to take new technology for spin.

Linux and SATA get along famously. Recent kernels have drivers for most of the SATA controllers in modern systems, including the VIA and Promise controllers on my ASUS A8V Deluxe motherboard, so all I had to do was plug my new drive in and start setting it up. Much like USB and Firewire drives, the SATA drivers actually use the Linux SCSI subsystem, so they appear in /dev as sd devices like sda, rather than hd devices like hda. If you check your system logs after bootup (I usually just use the dmesg command, piped in to 'less' to make reading back easier), you should see your new drive:

```
scsi1 : sata_via
Vendor: ATA     Model: ST3160827AS
Rev: 3.42       Type: Direct-Access
ANSI SCSI revision: 05
SCSI device sda: 312581808 512-
byte hdwr sectors (160042 MB)
```

If you compile your own kernels, you'll find the SATA drivers under Device Drivers/SCSI device support/SCSI low-level drivers – make sure you have SCSI support, SCSI disk support, and your SATA driver all built in to the kernel, since Linux understandably has trouble loading driver modules off a drive it doesn't have built-in support for.

'Linux and SATA get along famously. Recent kernels have drivers for most of the SATA controllers.'

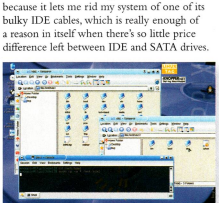


▲ The Seagate Barracuda 7200.7 – a great low-cost SATA drive.

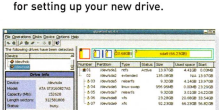
LINUX AND SATA

Serial ATA has been around for a while now, but it was a bit of a hard sell at first, since the drives were expensive and didn't deliver improved performance. Today, performance is improving thanks to Native Command Queuing, or NCQ, which lets the drive and controller reorder requests to produce more efficient drive access plans, but this is still emerging.

For me, I decided to go SATA mainly because it lets me rid my system of one of its bulky IDE cables, which is really enough of a reason in itself when there's so little price difference left between IDE and SATA drives.



▲ KNOPPIX makes a perfect platform for setting up your new drive.



▲ QTParted – things have come a long way since good old fdisk.

SYSTEM SETUP SHENANIGANS

Transferring an existing Linux system to a new drive can be a bit scary at first, but it's really not all that tricky. As long as you're careful not to alter your existing drive, you can just keep trying if it doesn't all go to plan at first. The method I followed breaks down in to a few steps:

1) Partition and format your new drive
2) Mount your new partitions and transfer your existing data over
3) Edit your fstab file to match the new drive layout
4) Re-install your boot loader

If you're brave or experienced, you can do most of these from inside your existing system, but with the various virtual filesystems that get mounted these days copying your root partition across can get very tricky, since you need to copy only the real folders, and then create empty folders for the virtual ones. I find it a lot easier these days to boot up a live CD like KNOPPIX, which gives you all the tools you need to get the job done, as well as a nice GUI that you can use to keep surfing the 'net while all your data gets copied.

In fact, Knoppix makes the first two steps a bit of a doddle. It ships with QTParted, a quite nice GUI-based partition editor that you can both create and format your partitions using whatever filesystem you like, and it also makes aliases on your desktop to mount any drives it finds on your system. The only thing to keep in mind is that it's best to reboot after you partition your new drive, to make sure the kernel has picked up the changes.

One-by-one, mount the partitions from your existing system and the partitions that you'll be copying them to on your new drive. I guess in theory you could use the Konqueror file manager to do the file transfer, but when it comes to such a critical task I'm not sure I trust a GUI file manager to do the right thing. Instead, I fired up a terminal and used the "cp" command to do the hard work:

```
cd /mnt/hda5
sudo cp -a * /mnt/sda5/
```

The '-a' flag tells cp to operate recursively,

copying the drive's entire contents, and to preserve permissions and symlinks while it's doing it.

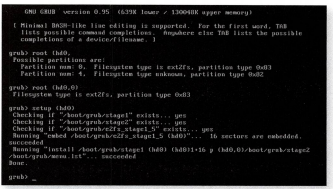
The rather oddly-named fstab file (it's short for filesystem table) in the /etc directory defines where each drive on your system is mounted – it's read and processed by your system's initscripts on startup. After copying my entire system across to the new drive, the new root partition had a copy of my existing fstab on it, clearly in need of some editing.

The fstab file uses a simple space-delimited format, with one filesystem per line. The first three fields on each line are the drive to mount, the folder to mount it into, and the filesystem type. After editing the drives to match my new filesystem layout, my new system was nearly ready to boot.

GOOD GRUB

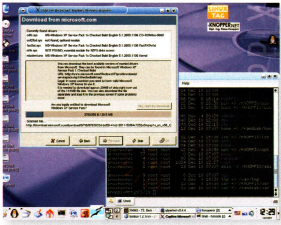
The final piece of the puzzle was to install a boot manager. I use GRUB, the GRand Unified Bootloader, since it makes it easy to tweak your settings at boot time in case you mess things up. Just about every Linux system has migrated from the older LILO boot loader to GRUB, so there's a good chance you're using it right now as well.

One of the things I never have far away from my PC is a GRUB boot CD, because it's incredibly handy for reinstalling it on to your boot sector. GRUB itself is pretty small, and hardly needs a CD, but to be honest I just don't have a floppy drive in my PC these days.



▲ Recreating your GRUB boot sector takes just a couple of commands.

If you've got GRUB installed on your system, building a bootable CD is easy. Create a folder somewhere, create a boot/grub folder inside it, and copy the stage2_eltorito file from your GRUB install in to this folder:



▲ KNOPPIX can also be used with Captive NTFS to access your Windows NTFS partition.

```
mkdir /tmp/grub-iso
cd /tmp-grub-iso
mkdir -p boot/grub
cp /lib/grub/i386-pc/
stage2_eltorito boot/
grub
```

I usually leave it at that, but if you want to customise your GRUB CD, feel free. You can put a copy of your menu.lst (called grub.conf instead on some systems) file from your /boot/grub in to the boot/grub folder you've just created to see your usual boot menus when you boot from the CD. You can even put kernels or other files on the CD and access them at boot time or from the config file. One you're happy with the setup, build the bootable image:

```
mkisofs -R -b boot/grub/stage2_
eltorito -no-emul-boot -boot-
load-size 4 -boot-info-table -o
/tmp/grub.iso /tmp/grub-iso
```

My minimalist GRUB CD image was less than 500KB – a waste of a 700MB CD perhaps, but better than dusting off a floppy (and a drive to match), and I'll have no reason to burn a new one until I need features from a newer version. I never like to burn a coaster though, so when I make bootable CD images I always like to test them in QEMU, the fantastic open-source PC emulator that I featured way back in August 2004:

```
qemu -cdrom /tmp/grub.iso
```

You don't need to do anything to burn the image – just use your favourite ISO burning app. I'm lazy, so I tend to use the CD burning built in to Nautilus, the GNOME desktop's file manager, which is as easy as right-clicking on the image and selecting Write Disc.

After booting from the GRUB CD, restoring the GRUB boot sector takes just a couple of commands – one to specify the root partition of your Linux drive (so that GRUB can find its files) and one to install the boot sector:

```
root (hd0,4)
setup (hd0)
```

Reboot, and your system should boot from your new drive without a hitch. ■

GRUB'S (SEEMINGLY) CRAZY DRIVE NAMING

If you've never played with your GRUB setup before, you're probably wondering what the deal is with its drive naming scheme. Rather than using Linux-style naming, like 'hda5' for the fifth partition on the first hard drive, GRUB uses its own (hd0,4) format. There are two good reasons why GRUB uses its own naming scheme, and the first is simple – GRUB is an independent project that boots all sorts of operating systems, so it wouldn't make a lot of sense to tie it too closely to Linux.

The partition numbering is also pretty easy to explain. GRUB counts partitions from 0 rather than 1, so your fifth partition gets labelled 4. The drive numbering is more complex though, and is the other reason why GRUB uses a different naming scheme to Linux. Linux names IDE drives based on their location (ie: the primary master drive is always hda), and SCSI drives based on their order of detection (so the first is sda).

By contrast, GRUB sees drives as they're configured in the BIOS: hd0 is the first bootable hard drive, hd1 is the second, etc. If you change the drive boot order in the BIOS, you change the drive numbers seen by GRUB. This has been the source of much confusion, since a lot of people naturally equate hda under Linux to hd0 under GRUB – if you're booting from your primary master drive, that's fine, but if you boot from another drive, or you put your only hard drive on the secondary master and expect GRUB to detect it as hd2, you could be in for a shock.

If you're not sure what's what in GRUB, drop in to the GRUB console at boot, type 'root hd', and then hit tab – GRUB will help you tab-complete your drive name, listing the available drives and the partitions found on them, complete with filesystem type.

Leigh Dyer
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NO PRESSURE

Give full reign to your creative impulse by breaking away from keyboard-based instruments, says Brian Heywood.

Those who've read my articles in *PC Authority* over the years will know that I frequently cover guitars. In part it's because my professional life these last couple of months has revolved around that instrument, in part because I'd guess that if you scratch a sizable proportion of *PC Authority's* readership you'll find a guitarist trying to get out, but mainly it's because many of the same principles apply to just about any other 'natural' musical instrument. Why is this important? Well, the way you physically play an instrument – its physical user interface – can affect the quality of the music produced. So if you play the same melody on a saxophone, a guitar or a keyboard, you'll get subtle differences in the resulting music beyond just the different tones. This becomes even more important when you create your own compositions, as each instrument has its own unique mode of operation that will influence the way you put the notes together.

Anyone who's been reading this column over the past ten years should have gathered that I have a professional interest in folk instruments. In fact, my masters degree project was to design and build a MIDI controller based on a free-reed instrument called the melodeon – basically a kind of diatonic squeeze box. As well as performing in this genre, I'm well aware of the role my instrument plays in composing and arranging the material I help perform.

You can hear an illustration of this principle if you listen to the music played by French ensemble Le Gop (http://legop.free.fr). On their original tracks you might notice that they often have very long, flowing melody lines, and I'd say that this is due to the fact that one of their main writers (Jean-Luc Gueneau) plays the hurdy-gurdy, a keyed string instrument that sounds a bit like a cross between bagpipes and an overdriven electric guitar. The hurdy-gurdy is sounded by turning a handle, which means that, unlike a wind instrument or a plucked guitar, the player can never run out of notes, allowing for very long – almost liquid – melody lines.

▲ You can convert any instrument into a MIDI controller if you have enough ingenuity (and time). Here's one I made earlier; a MIDI Melodeon.

▲ Even high-specification professional MIDI controller keyboards such as this Roland A-70 don't give you key (or polyphonic) after-touch.

'The player can never run out of notes, allowing for very long – almost liquid – melody lines.'

CUT-DOWN CONTROLLERS

Getting back to the PC, though, in many ways the standard MIDI controller keyboard that you'll find connected to your average 'music' PC offers a rather poor human interface when it comes to musical expression. It doesn't have to be poor, but that's the way it is in most cases. The music keyboard will have a basic geometry that derives from the piano, but not much else. In the 1960s, I remember reading Fred Hoyle's science-fiction novel *October the First Is Too Late* in which the main character – a concert pianist – ends up in the distant future and is supplied with a keyboard instrument that gives total control over the music's timbre and the articulation of every note played. This is possible to achieve, even using today's technology, and can be implemented using the current MIDI specification – but generally it isn't.

The technique is called 'key pressure' or 'polyphonic after-touch', and in conjunction with a suitable sound generator or MIDI module it can give exactly the effect that Hoyle wrote about back in 1966. While many mid-priced keyboards support channel pressure – which sums the pressure on all the keys currently pressed – there aren't many keyboards at any price level that allow you to control the sound of each single note by adjusting how hard you press it. This also applies to the MIDI sound modules that have to act on this information; many of them just don't implement this part of the MIDI specification.

Strangely enough, this facility was somewhat more common in older instruments such as the Ensoniq SQ-80 and the Yamaha CS80, and keyboards with polyphonic after-touch seem to be getting rarer if anything. For instance, Roland's top-of-the-range A-80 MIDI controller keyboard had a comprehensive after-touch implementation, while the more recent A-90 merely emulates it in software. At the other end of the range you'll find that cheaper MIDI controllers (such as the Midiman USB Keystation 61) may advertise that they implement channel pressure, but in fact they don't. Closer reading of the specification shows that they can generate this from a control on the front panel, so don't be fooled. It may not be enough to simply check the MIDI implementation chart – you may need to find out by other means.

The upshot of this is that certain techniques that are available to guitarists are simply not available – at least in real-time – to the keyboard performer. For instance, the ability to pitch bend, or add vibrato, to just one note out of a held chord isn't available to the majority of keyboard users. You could, of course, play one-handed and use the modulation and/or pitch-bend controllers, or else add these performance nuances

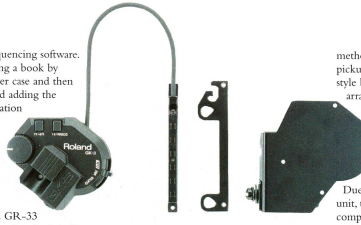
afterwards using your sequencing software. But that's a bit like writing a book by typing all the text in lower case and then going back afterwards and adding the capitalisation and punctuation retrospectively. Either practice puts up an artificial barrier in the way of your creative impulse.

ROLAND ROCKS

I've been using a Roland GR-33 guitar synthesiser for some time both in live performance and in the studio, but when I saw the information about the GR-20 it occurred to me that its smaller footprint would make it more convenient to take on the road. I was showcasing with WoodworX at the Strictly Mundial world music conference in Montreal in February, and I thought this would be an ideal opportunity to road-test the new Roland unit.

Both the Roland units are floor-mounted guitar-to-MIDI interfaces with a built-in sound generator, so as well as detecting the notes you played, they can produce the sound too. Not all guitar interfaces have this capability: for instance, the Roland GI-20 and the Yamaha G50 just do the pitch-to-MIDI conversion and need an external sound module to actually make a cheerful noise. The principle behind both units is that the audio output of each string of the guitar (or bass) is processed individually to extract both pitch and envelope information (for example, when the note starts), which is then converted into the equivalent MIDI information.

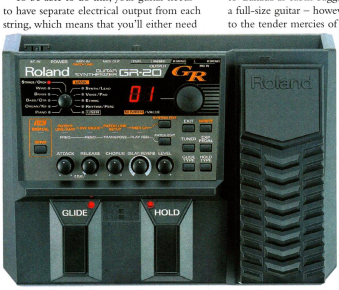
To be able to do this, your guitar needs to have separate electrical output from each string, which means that you'll either need



▲ The Roland GK-3 fits onto most types of electric or steel-strung acoustics.

to install a split electromagnetic pickup on your guitar or fit a polyphonic bridge pickup system on your acoustic guitar. This individual string information is then fed into the converter circuitry via a thin multicore cable. Both Roland and Yamaha produce electromagnetic pickups that are suitable for either acoustic or electric instruments. The American RMC Pickup Company in the US (www.rmcpickup.com) also produces a piezo-electric saddle system that can be installed internally in either a nylon or steel-strung acoustic guitar.

My GR-20 package came with Roland's latest variant of its divided pickup, the GK-3, which I was keen to check out. I already have two electric guitars with GK-2A pickups, but I wanted to check out how well the technology works on a steel-strung acoustic guitar. In fact, I installed it on my Shapelywood Leisa travel guitar (www.shapelywood.com), which I was taking to Canada as cabin baggage, rather than trust a full-size guitar – however well flight-cased – to the tender mercies of Air Canada's baggage handlers.



▲ The new Roland GR-20 pitch-to-MIDI unit makes it easier than it ever was before for a guitarist to check into the MIDI revolution.

The GK-3 is a significant development over the earlier models in that you can alter the curvature of the pickup to match the strings on your guitar, allowing each of the pole pieces to be set a constant distance from the strings so you get a consistent response across the neck, essentially customising it to your guitar. Like the earlier models, it comes with a variety of temporary and permanent fixing methods, including a plate that lets you fix the pickup to a Gibson Les Paul (Tune-o-Matic) style bridge. Other changes include a re-arrangement of the pickup controls and the use of a normal jack plug, rather than a mini-jack, to take the output from the guitar's existing pickup to the floor unit (via the multicore cable).

FOUR ON THE FLOOR

Due to the smaller size of the GR-20 floor unit, there are only two footswitch controls – compared to four on the GR-33 – and a pedal controller. The other main difference is the use of rotary controls (knobs) to select the sound bank and parameter controls, rather than having to use the increment/decrement buttons to step through the edit values. Roland seems to be moving more towards this approach, as the GI-20 also has a rotary control on the front panel.

▲ Yamaha also does a pickup that's compatible with the Roland standard.

In fact, the designers have streamlined the whole sound setup and editing process, which I found far more intuitive when editing the preset sounds to suit my musical purposes. The front-panel editing functions let you quickly alter the major attributes of the sound such as the attack, release, filter characteristics and level of the sounds, and you can force the synthesiser output to follow the amplitude envelope of the guitar string to make it behave more 'naturally'. They've also added a feature that lets you associate a MIDI program message with each sound patch, so you can use an external multi-effects module or guitar processor to select the GR-20's sound.

One disappointment for me is that the sound patches aren't compatible between the GR-33 and the GR-20, so I had to reprogram the unit from scratch rather than copy the ones I'd already developed for the older unit. Also, there's no PC-based editor software that would allow more sophisticated alteration of the sound parameters. I'd guess that this unit is pretty well targeted at live music and that anyone who wants to get deeper into the sound synthesis may well end up fairly frustrated with it. So I'd say that if you want to delve deeply into the nuts-and-bolts of guitar synthesis then maybe a GI-20 or Axon unit and an external MIDI sound module might be a better bet. ▶

While on the subject, I received this letter recently:

I use several PC VSTi synthesisers with my MIDI keyboard and I think it might be interesting to control them via the guitar – having control over ADSR, oscillator and filter would be different to the usual modulation and delay you get with guitar FX. I tried Lateral Solution's guitar synth but it didn't do much more than let me play the standard MIDI sounds.

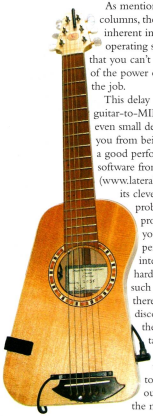
Are you aware of a VSTi synthesiser plug-in, which can be played live by a guitar, similar to NI's [Native Instruments] Guitar Rig only with a synthesiser rather than guitar amp/fx? Or perhaps I should try an analog- to-MIDI converter – with the advantage that I'd be able to use a multitude of VSTi synths. Are you aware of one?

Les

You have to break this problem down into two parts: how to encode the musical output from your instrument – such as the notes and nuances of your performance – into a MIDI data stream; and how to turn this stream back into an interesting noise. Both of these elements are problematical when you try to do them solely using a computer.

As mentioned in previous columns, the latency delay inherent in the computer's operating system means that you can't take full advantage of the power of your PC to do the job.

This delay is crippling for the guitar-to-MIDI stage, where even small delays can prevent you from being able to deliver a good performance. The software from Lateral Solution (www.lateralsol.com) – despite its clever approach to this problem – will probably not give you an acceptable performance interface. Even with hardware controllers such as the GR-20, there will be a discernable delay on the lowest notes, as it takes at least half a wavelength for the unit's electronics to be able to work out the frequency of the note being played.



▲ The GK-3 can be fitted on to a steel-strung acoustic guitar just as easily as an electric one.

However, unlike the software approach, under most circumstances this delay will be manageable. If you consider that the frequency of the guitar's bottom E is about 82Hz, you'll get a delay of at least 12 milliseconds due to pitch detection, to which you might have to add another five milliseconds of MIDI delay. Most musicians can feel delays as short as five milliseconds, so you can see there are certain physical limits that can't be overcome using a pitch-to-MIDI system. The only way around this is to use a direct-detection method like the Starr Labs Ztar (www.starrlabs.com), but this brings other problems, as it's essentially a new instrument.

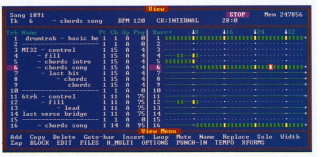
The second part of the equation is the conversion of the MIDI data back into sound. Again, you have the computer's latency getting in the way of real-time performance if you opt for a software solution. Software synthesisers, including VST plug-ins, rely on the PC's main processor to generate the waveforms that you hear as the audio output. For later playback, your PC software can compensate for this delay, but this can't be done while you're actually playing and recording in real-time.

Perhaps the best approach for responsiveness and control over the sound would be to use a SoundFont-compatible sound card with a hardware guitar-to-MIDI unit, such as the GR-20 or GI-20. Using this kind of sound card – say one of the Creative Labs Audigy range – would give the advantage of being able to use your computer to design the sounds, but behave like a hardware synthesiser when you're actually playing the guitar. ■

▲ The Ztar from US-based Starr Labs takes a different approach to guitar MIDI, by directly sensing the position of your fingers.

ONE FOR THE DOSSERS

Anyone who has an old PC with an MPU-401 compatible sound card lying about may be interested to know that the world's original MIDI sequencer is still available for download on the web. This DOS program dates from the early 1980s when Voyetra – which until that point had been manufacturing analog synthesisers under the name of Octave-Plateau – spotted the opportunities the PC could offer to the electronic musician. Originally developed for the Apple II, Voyetra quickly switched software development to the new IBM PC when it was released, and the resulting product was Sequencer Plus, the world's first professional-grade MIDI software for the PC. With more than one-million copies shipped worldwide, some bundled with sound cards, Sequencer Plus would have to be considered as one of the most popular music programs of all time.



▲ Sequencer Plus Gold is still an effective MIDI sequencer (no digital audio) and as it works under DOS, it runs like greased-lightning even on a 386 PC.

I still use Sequencer Plus as my main studio-production sequencer, running on a 486SX PC under Windows 3.11. I still find this to be the most reliable and rhythmically robust software I've come across to date – it's only crashed twice in the past ten years. You can download the software, drivers and FAQ documentation from Voyetra's website at www.voyetra.com/site/kb_ftp/340ftp.asp

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AUSTRALIAN PCAUTHORITY

HIS DARK MATERIALS

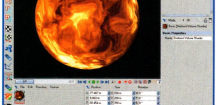
Tom Arah discovers a near-ideal, near-universal solution for generating 3D materials, and you can begin benefiting for free.

When looking at 3D graphics applications, attention is usually focused on their modelling capabilities, but surface appearance is equally important in creating realistic results. No matter how good the models are, poor materials handling will produce an amateurish appearance. This area is often overlooked, which is a pity, since it can frequently be radically improved as we'll see.

Materials are largely taken for granted, because most 3D applications use them in a similar way. Rendering a 3D scene involves calculating the way its objects interact with the available lighting, and this is almost always handled through materials – generally referred to as shaders – controlled by numerous interacting parameters.

To produce a shader for a realistic orange in 3ds max, for example, you first specify the colour orange for its main Diffuse parameter, which is by default automatically copied to the Ambient setting that governs the scene's indirect lighting. Then, using the Specular Highlight, Specular Colour and Glossiness parameters, you specify the shininess of the orange – the size, focus and colour of the highlights seen when it's illuminated directly.

However, a real orange isn't a perfectly smooth, shiny, uniformly coloured sphere, and more realism can be added by mapping a full-colour bitmap image (called a Texture Map) rather than a single, flat colour, onto its surface. A scanned-in photo of some real orange peel applied as a texture map to the Diffuse setting in the Maps roll-out in 3ds max's Material editor (or the equivalent in any other 3D application) immediately brings the orange to life. Better still, this same texture map can be dragged onto the Bump map setting, where its brightness levels are applied to simulate surface relief, producing the characteristically pitted appearance of real orange peel.



▲ It's the materials that bring 3D objects to life.

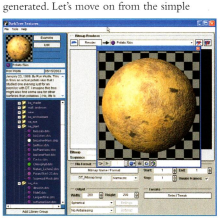
Whatever application you use, combining lighting-based shader parameters and texture maps is the stock-in-trade of the 3D artist. All you need is a JPEG, BMP or TIFF of the real object, which you can tweak or even radically alter using any standard bitmap editor. Memory requirements can escalate quickly with high-resolution texture maps, but rendering them is straightforward and can in many cases be sped up further by using widely available low-resolution seamless texture tiles. Using texture maps to simulate 3D materials is simple, flexible, fast and all-encompassing, so what's the problem?

While texture maps will always be central to 3D work, they're certainly not perfect. Bitmaps have a fixed resolution, so if you zoom in on a mapped object its quality deteriorates and eventually collapses. Also, any photo used as a texture map must, by its nature, be pre-lit, which can result in false lighting cues – say, the bumps in your orange peel were originally lit from the left but you want them lit from the right – which destroy the illusion of reality. And while photos are great for depicting exterior surfaces, they're much less successful for volumetric effects like fire and smoke, especially when these vary over time in an animation.

Even as straightforward surface materials, texture maps are fundamentally limited. Bitmaps describe 2D planes and applying them to a 3D model means wrapping them around it, but such wrapping can never be perfect. For common solids like our spherical orange or cubes and cylinders, most 3D applications will provide built-in projections to make the wrapping work as well as possible. For more complex shapes, advanced UV Mapping breaks the texture map down into discrete picture elements and attaches these to the underlying polygonal mesh, trying to keep distortion and visible seams to a minimum. It's never ideal, and for some complex textures the whole mapping approach just breaks down – a wood-grained texture map works perfectly for a flat, cross-sectional table top, but it will never look right when wrapped around a bowl because here the surface needs to reflect the fact that the wood's ring pattern is truly three-dimensional.

POTATO PROCEEDINGS

If texture mapping is a crude workaround, is there any alternative? Yes, there is: procedural textures, which are generated by an algorithm rather than sampled from the real world. And despite their mathematical nature, procedural textures don't need to look computer generated. Let's move on from the simple



▲ Although purely mathematical, procedural textures can produce stunningly naturalistic results.

orange to the humbler, but considerably more challenging, potato. To generate a realistic procedural potato-skin texture, you need to create a pattern of varying patches of brown, with the occasional darker eye and some surface cracking, overlaid with patches of dirt that should show a grainier texture to suggest soil. Each of these separate elements can be mathematically described as recoloured gradient greyscale patches, vein structures and random noise, which when combined produce the desired result – a believable potato material.

Procedural textures address all the major limitations of texture maps: they're infinitely scalable with their output resolution only determined during rendering; their memory requirements are minimal; they contain no pre-lighting cues and so fit perfectly into any scene; they can handle difficult materials like fire and water as easily as any other; and by changing the parameters over time, they can be simply and realistically animated. Most important of all, procedural textures can be applied to any 3D shape without distortion or

seams. For example, that bowl's surface would look as if it had been carved out of real wood.

Another advantage of procedural textures is that they can be varied according to scene-based factors like distance and angle, enabling effects like the automatic addition of dust, rust or snow to top surfaces, which hugely boosts believability. Lastly, they provide one more unbeatable advantage: because they're mathematically described, procedural textures can be quickly tweaked to produce a completely new and original material fine-tuned to the task in hand.

These advantages are compelling, but so are the downsides. We're talking about generating and regenerating the texture on demand for every rendering, and the more complex the texture the slower this process will be. Ever-faster computers make this processing overhead more bearable, and professional 3D packages can ease the pain – at least during test renders – by temporarily hiding some objects or swapping materials. The most advanced packages even let you 'bake' your procedural textures down into fixed texture maps, although you'll lose editability and become subject to resolution issues again.

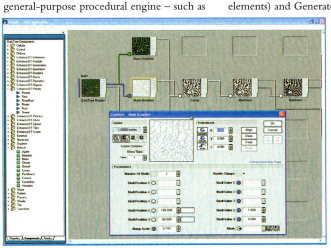
The biggest downside, though, isn't intrinsic but a matter of implementation: whereas all packages support material shaders and texture mapping, support for procedural textures is treated as an optional extra, with different applications providing widely different procedural texture functionality. Even the best support is ad hoc and arbitrary, providing, for example, simple wood or fire but not clouds or smoke. Worse still, for those few applications that do try to deliver a more general-purpose procedural engine – such as Poser with its node-based shader trees – the results are so complex they'll send non-technical users screaming.

'Despite their mathematical nature, procedural textures don't need to look computer generated.'

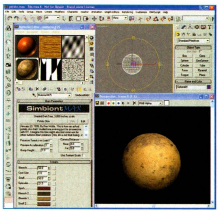
DARK TREE OF MATERIALS

What's needed is a more universal procedural solution in terms of application support, the textures it can generate and usability, and that's exactly what a little-known program called DarkTree 2.5 from Darkling Simulations provides (you can download a demo version from www.darksim.com). As a standalone, third-party program, you can benefit from DarkTree whatever 3D modeller you use, a particular advantage when many people use more than one. And as soon as you open DarkTree, it becomes clear that the program takes an all-encompassing approach to creating procedural textures. From its Library panel, you can explore hundreds of preset textures and the range is extraordinary: bricks, moss, planking, stucco, leather, snow, sand, lunar rocks, solar flares, cave walls, glass blocks and much more, and their quality is exceptional. Where most 3D applications' built-in wood or marble textures look like pale imitations, the DarkTree versions look like photos or even the real thing.

How is each preset texture created? To find out, simply double click to load it into its own editing window, where you'll see that it's built from a number of discrete components, arranged as interconnected sockets on a grid board. DarkTree 2.5 provides no less than 106 of these components, divided into categories like Pattern (for man-made regular patterns), Natural (for random patterns like clouds and veins), Control (for randomising regional elements) and Generator (for mathematical functions). Most powerful of all is the single Shader component, which can be optionally placed in the first Root socket. This operates much like the 3ds max shader system I described earlier, enabling you to build 3D materials from numerous interacting light-based parameters, each procedurally defined. These parameters include the old favourites like diffuse, specular, glossiness, bump and transparency, as well as more esoteric options like alpha, metal highlight and a clear-coat specular layer of adjustable thickness.



▲ Components are the key to DarkTree's texture editing.



▲ Simbionts enable you to apply DarkTree textures directly from within supporting applications.

The key to creating your own textures in DarkTree is the way you manage these components, which involves four main steps. First, add new components by dragging and dropping from the Component Bin tab down the left-hand side of the screen. Second, set up each component's broad parameters, double clicking to open them in their own dedicated Component Editor window. Third, connect the components together by right clicking on their Outgoing Links area, selecting a parameter and then dragging out a wire to connect to the desired target. Finally, hone the result either by returning to the individual component editors or, more powerfully, by identifying the most important input parameters wherever they appear in the texture tree as 'tweaks', which then get collected together under their own Tweak Editor tab for easy experimentation.

The principles are straightforward, but it would be misleading to suggest that you'll be creating potatoes, giraffe skins or star-fields within a few minutes. Realistic textures often require dozens of interacting components, so the number of parameters and possible interactions is almost uncountable. This complexity is inevitable, but DarkTree tries hard to minimise its effect. For example, each component has a thumbnail reflecting its current state, and within the editor you can see the effect of changes not just on the current component but also on its parent or on the final texture. There's an excellent PDF manual and online help, so the best way to ease yourself into DarkTree is to explore and edit the presets – this is about as easy as a procedural texture engine can hope to be. ▶

APPLYING TEXTURES

So once you've chosen, edited or created your procedural texture, how do you use it? At any point, you can drag the texture to the scalable Examine window and, using a screen-capture utility, copy the results to the clipboard or to a file. You can do this even in the save-disabled Demo version included on the cover disc, making it an excellent way to create flat, screen-resolution textures for 2D apps like Illustrator. The point of DarkTree, though, is for use in 3D work, and for this you'll need the full version with Bitmap Renderer, which lets you output at any resolution and supports alpha transparency. This version offers two main output options: Render Shaded uses distant lighting to ensure even effects, while Render Channels breaks the image down into raw colour, bump and specular maps, to be recombined within your 3D application for maximum quality. DarkTree 2.5 also supports planar, spherical, cylindrical and cubic output to cut down on mapping problems.

Most impressive of all, it can output UVW bitmaps to wrap around LightWave or Wavefront objects without distortion or seams, effectively pre-baking the texture to the model. Working this way combines the benefits of procedural textures and texture maps, but having to export and import texture maps is inconvenient. This is where Darkling Simulations provides its real masterstroke. By using its dedicated plug-ins called Simbionts, you can edit and apply DarkTree materials (either fully shaded DSTS files or colour DSTC, percent DSTP and bump DSTB map files) directly from within several major 3D applications. An impressive range of plug-ins to work with 3ds max, LightWave, Cinema4D, trueSpace, Animation:Master and RenderMan so far is available from www.darksim.com/html/download_simbiont2.html.

Each Simbiont integrates into its host differently, depending on the host's plug-in API, but in each case it enables DarkTree textures to be loaded, scaled and applied, as well as optionally opened into DarkTree 2.5 itself for editing. Often full editing isn't necessary, because if the texture's creator added tweaks during the design process these are made available via the Simbiont, enabling the texture to be fine-tuned or radically altered in situ. Install the Simbiont for your favourite 3D application and suddenly you have access to a huge range of customisable procedural textures that can be applied without distortion, seams or resolution problems and that mesh perfectly with your scene's lighting. The real jaw-dropper is the sheer quality of the end results, which make texture maps look anaemic and unrealistic by comparison.

However, the best is still to come. These Simbiont plug-ins are totally free – you don't even need to have DarkTree itself to use DarkTree textures (although, of course, having it gives far more editing power to power users). This is an amazing act of generosity to the 3D community, but there are sound business reasons for it. It makes DarkTree itself, which retails at US$419, a very attractive proposition for 3D studios, which only need to buy one copy to equip a whole team of designers with all the procedural textures they need.

▲ The Enhance:DT pack provides 1800 procedural textures.

The long-term ambition is much bigger than this. It is to develop DarkTree along open source lines as the open and universal texture solution. This is a two-pronged strategy: first, get 3D app developers involved, then encourage end users to freely share the textures they create. Here the release of DarkTree 2.5 was particularly important, as it provided free API access to the underlying DarkTree engine, to encourage third-party developers to extend it with new components and to integrate it closely into as many applications as possible. To encourage sharing, the Repository at Darkling Simulations' site www.darksim.com/Repository/ enables users to post their efforts and to download textures others have posted.

Is the strategy working? The answer is mixed. Third-party plug-ins have been developed for Mental Ray and Softimage XSI, again available via www.darksim.com. The Repository offers more than 300 additional textures in categories that range from plants to skin, buildings to terrains, almost all of astonishing quality (including an excellent ready-to-use potato skin!). The bad news is that the collection hasn't been updated since the end of 2003 and the monthly texture challenge has long been discontinued.

This is all a bit disappointing, but one developer has risen to the challenge with a vengeance. UK-based Richard Jennings at www.shaders.co.uk has produced the Enhance:DT add-on pack, which uses the DarkTree API to create no less than 150 extra components in 14 new categories – Skin, Space, Water and so on – that work in exactly the same way as DarkTree's own (even the component help files are fully integrated). You can use these extra components to create your own Dark Tree textures in entirely new areas, but the easier option is to take advantage of his pack of presets, which adds no less than 1800 to choose from!

This is exciting stuff, particularly if your 3D application is supported by a Simbiont, when you can benefit from Enhance:DT even if you don't have DarkTree itself (though Richard, please provide thumbnails and more tweaks to make this approach more powerful still). Combining the repository files with those included in the DarkTree demo and others picked up from the web, you have immediate access to more than 2500 procedural textures for an outlay of just US$69, the cost of Enhance:DT. It's hard to imagine a better deal or a better way to get into DarkTree itself.

And, of course, that's the real goal: to increase the number of texture designers and so the number of freely available DarkTree textures, which in turn will encourage more developers to build the DarkTree engine into their products, which creates more users and so on. If it succeeds, the end vision is a virtually limitless pool of freely available, high-quality, easily customisable, resolution-independent, perfectly mapping, perfectly integrating procedural textures, accessible by all users directly from any and all 3D applications.

Let's just hope something like it comes to pass. ■

TOM ARAH
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JARGON BUSTER: VOICE OVER IP

You'll be hearing a lot more about SIPs, ATAs and ENUM over the coming months. *PC Authority* busts some VoIP jargon.

▲ Most hard phones connect directly through a network to a VoIP provider and do not need a PC to operate.

ATA (ANALOG TELEPHONE ADAPTER)

ATAs are devices that allow a typical landline handset to interface with a computer or network. The simplest ATAs will connect via a USB port to a softphone application, while more complex ones connect straight into a gateway or router and communicate with a pre-configured VoIP provider.

ENUM

Telephone Number Mapping, or ENUM, is a method of mapping telephone numbers to a URI (uniform resource locator). As URIs can be email addresses or other URLs, a single ENUM number can be used as a container for all business or home contacts. Because of this catch-all contact number, ENUM has caused some concern from privacy advocates who fear its potential abuse for phishers and spammers.

HARD PHONE

Hard phones are similar to some ATAs, in that they're often configured to interface directly with a network, with or without a PC. Hard phones vary in their functionality, with the simplest ones acting like basic landline phones, while complex ones include call forwarding, caller ID and other features.

JITTER

This refers to the amount of variance in latency between packets. Heavy jitter means voice packets can arrive out of sync, which can result in choppy dialogue. Jitter, latency and bandwidth all work together to ensure voice streams arrive in time, without delay, and at a high audio quality.

▲ Softphones like Firefly let you connect to a VoIP service via a standard microphone and headset.

LATENCY

This is the time it takes for a packet to make a round trip from its source to destination, and back again. With email and web browsing, high latencies are annoying, but bearable. Phone calls, however, are highly affected by even mild latencies. Like bandwidth, latency is crucial to the quality of a VoIP call as it determines the amount of delay during a conversation. A delay above 500ms, or half a second, is the maximum for an acceptable call.

PSTN (PUBLIC SWITCHED TELEPHONE NETWORK)

The PSTN system is the traditional telephone network, most commonly used to connect typical landline phones. For VoIP phones make calls to a phone on the PSTN system, and vice versa, a special gateway is required. Additionally, for a PSTN phone to call a VoIP phone, the VoIP number must be registered by your VoIP provider, which incur a cost.

QUALITY OF SERVICE (QOS)

This refers to a standard level of requirements that a VoIP service must meet. It refers to latency, reliability, up time and other factors that determine the quality of a voice call.

SIP (SESSION INITIATION PROTOCOL)

A protocol that allows voice, video and other multimedia sessions to be set up between two or more devices. Like HTTP, it supports name mapping and redirection as well as call forwarding and other standard telephony functions.

SKYPE

This is one of the most popular global VoIP providers out there, joining the ranks of Firefly and BBP Global in Australia. Like most VoIP services, it offers a free softphone client, free calls to other members, and calls to PSTN and mobile phones for a reduced fee.

SOFTPHONE

Software-based phones use your PC to connect to a VoIP server. The software is typically free, requires speakers and microphone, and functions similarly to an IM service. Other features can include voice mail, attachments and video conferencing, the latter being a distinct advantage over most hard phones. Skype and Firefly are two such services that offer softphones.

VOIP (VOICE OVER IP)

Technology that allows voice calls to be made over an IP-based network. VoIP technology has been around for over a decade, but the relatively poor quality of dial-up connections and early broadband meant it led to disappointment. The last two years has seen a re-emergence of the technology, with high bandwidth connections, lower latencies and competitive plans making it attractive to subscribers. VoIP services can be either exclusively internet-centric, where it is often free for calls to other internet phones; or it can can access calls to and from PSTN-based phones for a fee. ■

GAMELABS

Ben Mansill gets Juiced up, steals some cars, and goes for Glory.

BYTES

BATTLEFIELD 2 DEMO OUT!

It's time to get excited (like, really excited) because the long-awaited Battlefield 2 demo is out. If you've seen the previews of Digital Illusions CE's latest title you'll know just how terrific-looking it is. Add to this what will no doubt be awesome multiplayer, there's no way you can pass this title by. If you feel up for some frenetic MP action, you can grab the demo from EA's official BF2 site: www.eagames.com/official/battlefield/battlefield2/us/home.jsp

AXE TRAUMA

On a sadder note, and staying with Battlefield, DiCE has axed Trauma Studios, the group responsible for the Desert Combat mod for the original Battlefield. DiCE really has Trauma to thank for making the series as popular as it is today, and the disbanding of this talented group of individuals is disappointing to say the least. While it's true that the staff is to be distributed among DiCE's other offices, the studio itself is no more.

HANDHELD HACKING

These days companies like Nintendo, Microsoft and Sony have to accept the fact that any console they release is going to be hacked – including portable units. So, the inevitable deconstruction of the Nintendo DS should come as no surprise, with the Playstation Portable's UMD format torn asunder just months ago. Now users can load DS games onto rewriteable memory cards, making playing games illegally as simple as downloading the appropriate game from the internet. Although it's unknown at this time how Nintendo will retaliate, Sony has already taken steps to minimise the damage by releasing a new firmware for the PSP that prevents users from playing copied games. Not that this has any chance of lasting more than a few weeks unhacked.

THE RATINGS GAME

Aussie government still not game for an 'R' rating.

The OFLC recently announced new classification markings for computer games. The 'unified' design was claimed to bring game and movie classifications into line. Attorney General Philip Ruddock said: 'Our unified system of classifications for films and computer games is a world first that makes it easier to understand the content of films and computer games.'

That sounds great, but the fact remains that games and films are no more unified than they were under the previous system. Previously, game and film ratings were the same all the way up to the MA15+ rating, where games top out and films continue through to R18+. The new system is no different, and the demand from many consumers for an R18+ rating for games remains unheeded.

Some would say it's a moot point, as the OFLC currently uses MA15+ for almost every game with violent content. Very few games are actually refused classification, and those that are have thus far been of dubious quality and won't be missed.

Sex in games – that other contentious issue – is nearly non-existant. Game developers know where the line in the sand is and rarely cross it. The most recent game to be refused classification for sexual content was Leisure Suit Larry: Magna Cum Laude. The naughty bits in that game were cartoonish and more than a little low-rent. Hardly a graphic portrayal of anything potentially harmful, but by all accounts the game was a dud anyway.

Calls for an R rating for games will continue. Many gamers feel that it is the issue itself, rather than the games which are being banned, and retailers and distributors may not want to miss out on the potential revenue 'adult' games could generate.

However, the government has again made its position clear, so change isn't likely to happen anytime soon.

▲ **The unified colours of classification.**

The OFLC claims the new markings are easier to identify on typical game box packaging, making buying games less confusing for parents. Remember that 'G' doesn't necessarily mean it's a game made for kids, it's just devoid of sex or violence. Almost all First Person Shooters are MA15+ – and they're the games most popular with kids. Do you know what your kids are playing? It could be a good time to check.

BEST OF E3

The 2005 E3 games expo revealed exciting sequels to some of the greatest games of all.

Quake 4

FROM: Raven **WHEN:** TBA

id Software's decision to make Doom 3, and make it a single-player game surprised many. The company owned the online gaming space with Quake 3: Arena, and it was a brave decision to move away from its core focus. Now, we have a new Quake on the horizon, and it too is focused on the single-player. The story picks up immediately after the end of Quake II. Where you, hopefully, laid waste to the Strogg homeworld. Now Earth's armies are launching an all-out invasion of what's left of Strogg, with you leading the charge.

Platoon management is likely, and vehicles have been promised. This brings Quake up to speed with what you'd expect from any other FPS. Development work is being done by Raven, who has a strong legacy of working with id on spin-off projects. Raven's rich body of work includes Hexen 2 and Heretic, Soldier of Fortune 2 and Jedi Knight 2. No

firm release date has been announced, but Christmas is our safe bet.

Civilization

FROM: Firaxis **WHEN:** TBA

As rights to the Great Civ have moved around the games industry, sequels come regularly, and are of erratic quality. Now back in the safe hands of the game's creator Sid Meier and his company Firaxis, the next Civ promises a return to core Civ gaming and less tangental nonsense.

The game screen is now rendered in full 3D, and is zoomable from space to peasants. New gameplay elements offer traditional Civ gaming but with a strategic twist. Religion is now a key player. Spread word of your One True God around and other cities will grant favour and information.

The tech tree has also been given radical surgery. No longer a group of diverging paths, a player can pursue a particular tech without being forced through others. Additionally, your playing style can now be emphasised by a choice of two starting leaders for each Civ, each with their own special strengths and weaknesses.

There's so much in the new Civ that is a streamlining of what we know works. Anyone disappointed by some of the odd Civ games lately should build up some faith for the return of the great Civilization.

Heroes of Might and Magic V

FROM: Ubisoft **WHEN:** Early 2006

As the world turns, so will there be another HOMM game. Turn-based strategy lives on with this glorious series, now held by Ubisoft.

Almost nothing is new, we're pleased to report. Combat is now rendered in 3D, but that's about it for newness. Same is the dice-roll combat style, the uncovering of new corners of your lands filled with riches and peril. Same are the production house cities pumping out fodder for your endlessly exploring armies.

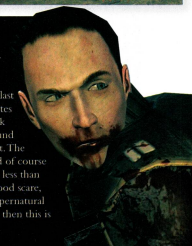
Ubisoft do boast a 'more mature universe', which does worry us a tad. We like our Iron Giants and Faeries, we do – it makes HOMM the charming fairytale of the strategy gaming world. HOMM 5 is a most welcome addition to a series with such a grand legacy. It also bodes well for aficionados of turn-based strategy gaming, keeping the arcade RTS wolves at bay.

F.E.A.R

FROM: Monolith **WHEN:** September

Mounting the beaches of Normandy or parachuting through AA fire won't scary enough, developer Monolith wants us to battle the paranormal with nothing but a shotgun and a dimly-lit hallway. Like that was ever easy.

This is the premise of F.E.A.R., a new first-person shooter from the same people that brought us No One Lives Forever and Blood. Combining the latest in graphics technology – normal mapping, specular lighting, fully-dynamic shadows and the most realistic fire seen to date – F.E.A.R. has the potential to be the most frightening FPS since Doom 3 hit last year. What really separates this game from the pack is the enormous all-round effort that's gone into it. The plot, the characters, and of course the visuals, are nothing less than perfect. If you love a good scare, or just like shooting supernatural baddies in their droves, then this is the title for you.



Imperial Glory

FOR
Graphics, attention to detail, and Total War-style strategy and tactics.

AGAINST
Strategic interface is clumsy, long campaigns too slow.

OVERALL ★★★★★☆

Pyro Studios, the development team behind the Commandos series, has turned its hand to the hybrid RTS/table-top strategy genre – a genre which consists primarily of Creative Assembly's brilliant Total War games. Rather than try and re-invent the genre, Pyro has simply taken every single element of the Total War series and dressed it up in Napoleonic clothing. In fact, the similarities are so strong that at first glance you'd be convinced that you were playing a Total War game.

The game plays out on a 3D battlefield, or sea, with an optional campaign component on a 2D map of Europe. Like the Total War series, it also features quick battles and historical scenarios, with realistic weather effects and terrain mapping and accurate unit breakdowns for the era's five major players: France, Russia, Britain, Austria and Prussia.

The 3D interface looks great and works well – in every way on par with Total War's 3D engine in Rome. Battles can involve defending a position, defeating the enemy, or taking and holding objectives. One area where Pyro has managed to expand, however, is by introducing sea battles into the mix. Sea battles consist of lining up the broadside of your ship, selecting your ammunition type, and firing. While the sea element is a welcome addition, it's clunky interface makes it far less fun than it could be.

The strategic map plays and feels like a boardgame which, again, is highly derivative of the Total War games, right down to the sound effects that accompany the movement of the pieces around the map. It's here that your Imperial campaign plays out, where you manage your territories, research new technologies, and conduct diplomacy. While it's easy to get into, we found the pacing to be too slow, with limited early forces and creeping research. However, there are some nice touches, like the addition of 'sympathy' to prevent heavy war mongering; a swag of diplomatic tools; and a variety of options to build up your trade routes.

While it's all something we've seen before, this is the first time the Napoleonic era has had such in depth treatment. That it happens to be derivative of Total War is beside the point – Imperial Glory is one of those rare gems that mimics a very successful franchise and manages to pull it off. The only question now is what's coming up from Creative Assembly now that the Napoleonic era, which was surely next in line, is now well and truly covered.

REQUIREMENTS
Windows XP; 1GHz CPU; 64MB DirectX 9.0 graphics card; 2.5GB HDD.
SUPPLIER Eidos Interactive
PRICE $89.95
www.imperialglory.com

▲The strategic component is slow, but the interface is user friendly.

▲Although clunky, the sea battles round out the gameplay.

▼The fully 3D land battles are Imperial Glory's highlight.

Pariah

FOR
Decent-paced single player and frenetic multiplayer; looks pretty.

AGAINST
Shows console heritage in worst of ways; basic action doesn't inspire play.

OVERALL ★★★★☆☆

Sometimes it's best to deliver bad news straight up – Pariah is a really mediocre first person shooter. Courtesy of the folks at Digital Extremes, Pariah is the developer's first real solo foray into the games market, having lived in the murky volumetric shadow of Epic's Unreal series for almost a decade. Perhaps then it's understandable that Pariah isn't at all ambitious, providing a reasonably engaging story accompanied by 10 to 15 hours of gameplay – and not much else.

▲Thanks to the Unreal engine, Pariah is one good looking game.

▼The cutscenes push along a standard sci-fi mystery tale.

And it is the story that, admittedly barely, carries Pariah. Set in the far future, the player controls Dr Jack Mason, a physician with a patient suffering from a mysterious ailment. The ship carrying Mason and his human cargo is shot down during its trip from a prison facility to a medical station, leaving both stranded in the surrounding wastelands. It is from these humble beginnings that the plot sprouts various insipid buds – ones that flower at predictable moments over the course of the game.

Along with the usual assortment of guns, including a machinegun, rocket launcher and shotgun, the player can obtain 'weapon cores'. These cores allow you to upgrade your arsenal by increasing magazine capacities and damage or lowering recoil and reload times. A few upgrades add new features to your weapons, but a lack of instruction makes it hard to discover their uses. There's also a strong vehicular component to the game, however, it doesn't feature hugely in the single player.

It should be noted that Pariah is an Xbox port, so many of the customary FPS frills you find on a PC title are missing. Such frills include the option to save anywhere and

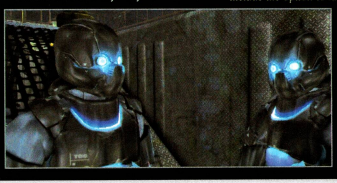
'Pariah is a decent diversion and a playable FPS, but it brings little if anything to the current selection of shooter titles...'

advanced PC-centric video, control and audio toggles. For example, auto-aim is enabled by default – while great for taming the inherent inaccuracy of a console controller, it trivialises combat with a keyboard and mouse.

DE uses the Unreal engine to power Pariah, and because of this the game has competent visuals. Unfortunately the console heritage hurts level and texture complexity even though the engine is more than capable.

What makes the game particularly average is the pacing. Some levels leave you to fend for yourself in a mash of activity while others are painfully linear and, thanks to the checkpoint save system and the impossible-to-skip cut-scenes, Pariah requires a great deal of patience to complete.

Pariah is a decent diversion and a playable FPS, but it brings little if anything to the current selection of shooter titles – in the PC arena at least.



REQUIREMENTS
2.0GHz CPU; 512MB RAM; 64MB DirectX 9.0 graphics.
SUPPLIER THQ
PRICE $89.95
www.thq.com.au

◀It looks and plays like Halo, but Halo it certainly is not.

Juiced

FOR
Knockabout fun; almost infinite personalisation.

AGAINST
Unsatisfying driving physics; mucking around between races.

OVERALL ★★★☆☆☆

Juiced pays tribute to EA's Need for Speed: Underground, as much as NFS: Underground pays tribute to the film 2 Fast 2 Furious. Got rice? Welcome to the world of tricked out Japanese 4 cylinder street racing, where what's under the hood isn't quite as important as the pearlescent paint and decals on top of it.

PC Authority readers with a 'fully sick' Nismo GTR and conspicuous turbo pop-off valve will love this arcade racer. Juiced embraces the best of the underground street racer culture. Camry drivers will find it amusing, in a scornful derisive fashion, but cultural prejudice doesn't get in the way of enjoying this game, it just makes it funnier.

Heavily weighed down with gameplay that makes the actual driving feel incidental, Juiced doesn't miss a trick. You're asked to select a mobile phone and car stereo brand from a range of funky options when starting the game first time. Between races you'll use the phone to challenge other homies, plus build up your address book for the ultimate Nokia.

'Playing through the story-mode is repetitive and often boring.'

The driving is soft, easy and arcade. Opponents will deliberately ram and bam you into walls, upsetting racing sim purists enormously, but it's tidy brainless fun. Betting cash on yourself before a race will hopefully fund car tweaking. THQ boasts 7.2 *trillion* possible car upgrades, and most of these are cosmetic.

Playing through the story-mode is repetitive and often boring, but the arcade nature of Juiced makes it a multiplayer treat. This one will win respect at a LAN, but don't expect it to satisfy your serious racing urges.

◀With 7.2 trillion tweaks, blue and purple get their day in the sun.

REQUIREMENTS 1GHz CPU; 256MB RAM; GeForce 2 or better.
SUPPLIER THQ
PRICE $79.95
www.thq.com.au

Delta Force Xtreme

FOR
Great missions now looking better than ever.

AGAINST
A bit short, too easy to finish in a weekend.

OVERALL ★★★★★☆

Here's a new twist on extending the life and profitability of a game! The traditional way is to release a mission pack – a large handful of new missions and a couple of new toys (guns/vehicles/+16 Bastard Swords) in a pack that's installed over the top of the original game. Novalogic has instead reworked its 2-year old Delta Force into an 'Xtreme' version. It's more than a Director's Cut, and much more than a simple mission pack.

Delta Force was a very capable shooter. It's strength is a good emphasis on single-player gaming – at odds with the multiplayer trend these days. Multiplayer was and still is supported, but community support is sparse, when compared with the big guns like UT2004 and the immortal Counter-Strike.

Xtreme adds several new missions, all of which are crackers, all wrapped up in a brand new 3D graphics engine. It models typical (apparently) US Delta Forces missions, you'll be spending most game time infiltrating enemy bases and knocking out key assets. The pacing is great, the first half of most missions involves slowly moving in, taking out perimeter guards and defenses, and they end with a terrific firefight in the heart of the badlands.

A hefty range of weapons are included, but it's rare that you'll need more punch than your M-16. The nice thing about Delta Force is that it feels nicely hardcore to play – sneaking around sniping guards off towers and the like, but is almost arcade-like in its simplicity and the fun that it delivers. This makeover makes it a new game, and an impressive bargain at just 40 bucks.

REQUIREMENTS 1.2GHz CPU; 512MB RAM; 2GB HDD.
SUPPLIER Vivendi Universal Games
PRICE $39.95
www.novalogic.com

JOYTECH
WilliamsF1 Team Force Feedback Racing Wheel
PS2 Wireless Analog Soft Touch
PERIPHERALS FOR THE SERIOUS GAMER

GTR

FOR
Speedy, grunty and thrilling racing; amazing realism.

AGAINST
Unforgiving and frustrating until you hit the groove.

OVERALL ★★★★★★

GTR is, without any doubt, the very best racing simulation on the market. It has set a new benchmark for quality which will be hard matched for the foreseeable future, and that it comes from a tiny independent developer is astounding. In fact, we can't help thinking that being free from major developers and their clone mindset actually helped make GTR what it is.

Being an unparalleled simulation of the European FIA GTR Championship means GTR is all about fearsomely powerful mid-engined sports cars that are beautiful to look at. Over 70 cars are in the box, and the community has already come close to doubling that number, as the game fully supports car and track mods.

There is an arcade mode, and a suite of driver aids to help get these beasts around the track, but that defeats the purpose of this sim. To enjoy the incredible physics and handling you simply must drive in the raw, with all aids off. A couple of days practice like that and it'll click, then you'll be in the zone and able to enjoy the thrill of thrashing 700bhp monsters around gorgeous European tracks. Being good at GTR is a gaming satisfaction unlike any other racing title. The rewards are not some contrived gaming formula, but the deep satisfaction of knowing achieving a mastery over something very difficult.

There's simply not enough space here to properly do justice to this astounding simulation. Every aspect of the complete package is flawless. The detail mind-boggling. Truly a must-have game.

REQUIREMENTS
1.2GHz CPU; 384MB; DX8.1 or higher graphics.
SUPPLIER Atari
PRICE $79.95
www.simbin.com

Grand Theft Auto: San Andreas

FOR
Classic GTA gameplay; new missions; style and charm.

AGAINST
Low resolution textures; a little too similar to the originals.

OVERALL ★★★★½

Few games have been as unanimously well-received, and so uniformly controversial, than the Grand Theft Auto series. By its very name, this conjures up gameplay that involves criminal activity, however the design, interface, plot and overall style that the series offers is unmatched by any other game in the genre. San Andreas is the latest of the lot, after debuting on the Playstation 2 last year, and it's taken the series to even further heights.

San Andreas is the game's eponymous location, which is a mythical replica of early 1990s California. You start out as Carl 'CJ' Johnson returning to his old neighbourhood for your mother's funeral. As is typical of the GTA series, you're thrust into a deviant life as you embark on a swag of classic crime capers like drive-bys, mob hits, and, of course, auto theft. The free-form exploration that made the game so famous is back – you can spend hours just roving around the city.

Unfortunately, while this is as good as GTA gets, it's starting to fray around the edges. Our PCs are far more capable than the current crop of consoles, and the graphics in San Andreas just can't compete with the most recent 3D games we're used to. That aside, the interface has made the move to PC quite well – the mouse control is more than an adequate substitute for a console controller.

Ultimately, while there are enhancements over the series, this is still the same GTA we've grown to love. If you're fan, you should already have it, and if you're new to the series, there's no better title to cut your teeth on.

REQUIREMENTS
1GHz CPU; 256MB RAM; 64MB DirectX 9.0 graphics card; 3.6GB HDD.
SUPPLIER Take Two Interactive
PRICE $89.95
www.rockstargames.com

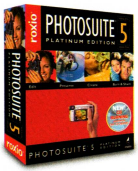
On the CDs

3 FULL VERSIONS

Ron Osborn brings you a complete guide to what's on this month's CDs.

PHOTO KIT

Tweak, edit and organise your photos!



Roxio PhotoSuite 5 LE*

Turn problem photos into works of art with Roxio PhotoSuite 5 LE. With an easy-to-use interface you can quickly aquire images from your digital camera or scanner, make neccessary adjustments and save the results to your computer. PhotoSuite can also organise your photos into searchable

albums to make it easy to find a specific photo. Once you're happy with the way your images look, you can use PhotoSuite to easily create slideshows to send to family and friends. To register for your free serial number visit www.roxio.co.uk/cd.

Upgrade offer:

If you've enjoyed using PhotoSuite 5, you can upgrade to another Roxio product such as PhotoSuite 7 or Creator 7.5 and recieve a 10 percent discount. For more information visit www.roxio.co.uk /adban/cd-upgrade/upgrade_aud.jhtml.

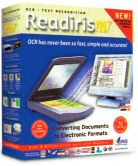
ACDSee 7.0 PE*

Order your digital image collection with ACDSee 7.0 PE. Create your own customised albums, add keywords to images or view images according to the month in which they were taken. You can even record audio notes for JPEG and TIFF graphics that are saved within the image file. Conversion and editing tools will also help to keep your photo collection looking tidy. When it comes to sharing your photos, ACDSee gives you the option of creating

slideshows in a variety of formats. To register your copy follow the prompts when you run the program.

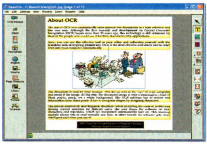
Upgrade offer:

Upgrade to the retail edition for extra view modes plus the ability to work with almost any archive format. For more details, click 'Upgrade Now' from the 'Help' menu.



Readiris Pro 7*

Turn printed documents into electronic, editable text. Digitising your documents is made easy with the program's OCR Wizard which guides you through the process. Once you've identified page elements and set the document language, Readiris Pro 7 will create an electronic copy in seconds.



The program also provides access to scanner controls to help you get a clearer scan of low quality documents. To register for your copy of Readiris Pro 7 use the serial code **532804200500101** when you first run the program, then select 'Registration Wizard' from the Register menu within the application.

Upgrade offer:

Version 10 includes support for PDF files. Read in PDF files and export them as text, or convert scans into PDF. Recognition and accuracy have improved. To upgrade, select 'Upgrade' from the Register menu.

*Online registration required

CORRECTION

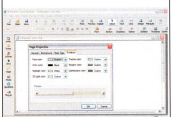
The registration and upgrade URLs for Acronis Privacy Expert Suite Personal 8.0 in the July issue were incorrect. The correct registration URL is www.acronis.com/mag/pcauthority-privacysuite. To take advantage of the upgrade offer to the commercial version of Privacy Expert Suite 8, visit www.manac.com.au/pca. We apologise for any inconvenience caused. The software was provided courtesy of Manaccom.

Ozmusicweed

This is true rock in it's rawest, most powerful and staunch form. Motormoth's sound has been described as a cross between Black Label Society, Kyuss, AC/DC and Soundgarden. The August 04 edition of *Kerrang* magazine included Motormoth in it's '10 Aussie bands you MUST hear' article. The band's latest studio effort, 'Cosmic Tonne Overdrive' is out now on Ward69Records thru MGM distribution.

FREEWARE

Belarc Advisor 7.0L
IE PrivacyKeeper
Kolorgenerator 1.1.0.3
Mmm Free 2.0
Pablo Commander 1.4
PocketKnife Peek 1.2
Portello
qs Hotkeys
Quick 'n Easy FTP Server 2.7
WYSIWYG Web Builder 1.8



WYSIWYG Web Builder 1.8

DELTA FORCE: XTREME brings back all the action of the original Delta Force game with updated graphics and a brand new game engine. Old missions have been enhanced and new missions have been added. The game also features co-operative and competitive multiplayer modes.

DISC 1

Full Versions
- Roxio PhotoSuite 5 LE
- ACDSee 7.0 PE
- Readiris Pro 7

Freeware
- Belarc Advisor 7.0L
- IE PrivacyKeeper
- Kolorgenerator 1.1.0.3
- Mmm Free 2.0
- Pablo Commander 1.4
- PocketKnife Peek 1.2
- Portello
- qs Hotkeys
- Quick 'n Easy FTP Server 2.7
- WYSIWYG Web Builder 1.8

Multimedia
- Audacity 1.2.3
- DivX Codec 5.2.1 (Windows 2000/XP)
- DivX Codec 5.2.1 (Windows 98/ME)
- FreeRip 2.941
- IrfanView 32 3.95
- Musicmatch Jukebox 10 Basic
- ThumbsPlus Pro 7
- Winamp 5.08
- Windows Media Player 10 (XP)
- Windows Media Player 9 (98/ME/2000)

Windows Essentials
- Access Manager 2 Free Edition
- Ad-aware SE Personal 1.06
- Adobe Reader 7.0
- AVG 7.0 Free Edition
- EditPad Lite 5.4.3
- ExplorerXP
- Google Desktop Search
- NOD32 Antivirus System 2
- Spybot Search & Destroy 1.4
- True Launch Bar
- Tweak UI
- WinRAR 3.42
- WinZip 9.0

DISC 2

Games
- Delta Force: Xtreme demo

Ozmusicweed
- Featured artist - Motormoth

Internet Essentials
- AOL Instant Messenger 5.9
- Crazy Browser 1.05
- CWShredder
- FileZilla
- Google Toolbar 2.0
- LeechGet 2004
- Mozilla Firefox 1.0.4
- Mozilla Thunderbird 1.0.2
- MSN Messenger 6.2
- Portable Firefox 1.0
- Remote Administrator
- ServerQuerry
- SpamBayes 1.04
- Trillian Basic 3.1
- ZoneAlarm

Patches/Updates
- Ad-aware reference file
- ATI Catalyst 5.3 driver suite (98/ME)
- ATI Catalyst 5.5 driver suite (2000/XP)
- AVG Free Edition Updates
- DirectX 9.0c
- McAfee VirusScan 5.x and 6.x DAT file
- McAfee VirusScan SuperDAT file
- Norton AntiVirus definitions update
- NVIDIA Forceware drivers (2000/XP)
- NVIDIA Forceware drivers (95/98/ME)
- Spybot Search & Destroy Update
- VIA Hyperion 4in1 drivers

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PC AUTHORITY CD REPLACEMENTS
Reply Paid 479
North Sydney NSW 2059

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AUSTRALIAN PC AUTHORITY

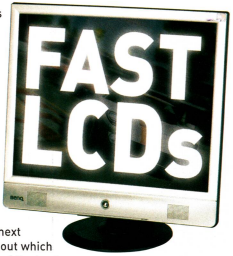
ON SALE 03 Aug 2005

NEXT MONTH...

BUDGET BOARDS

They're the often overlooked backbone of your PC, but they're more important than ever. With AMD and Intel widening their product ranges, and PCI Express becoming the new standard for graphics cards, it's easy to get confused by the mishmash of chipsets, price points and features. Next month *PC Authority* gives you the lowdown on the latest low end boards, and tells you which ones will make the best home for your components.

SUPER FAST LCDS



Only a few months ago we tested the first three 8ms LCDs on the market. Now, LCD technology is surging ahead with more vendors and faster speeds pumping onto the market. We put out the call to all LCD makers to send in their fastest screens – next month, you'll find out which screen is the best of the best.

NEXT GENERATION NOTEBOOKS

Our reviews section next month shouldn't be missed. Among our usual round up of the latest kit on the market, you'll also find new PCs and notebooks hitting the shelves, and *PC Authority* has its hands on all of them.

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Viewsonic 18
Vistra 71

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EPS0796

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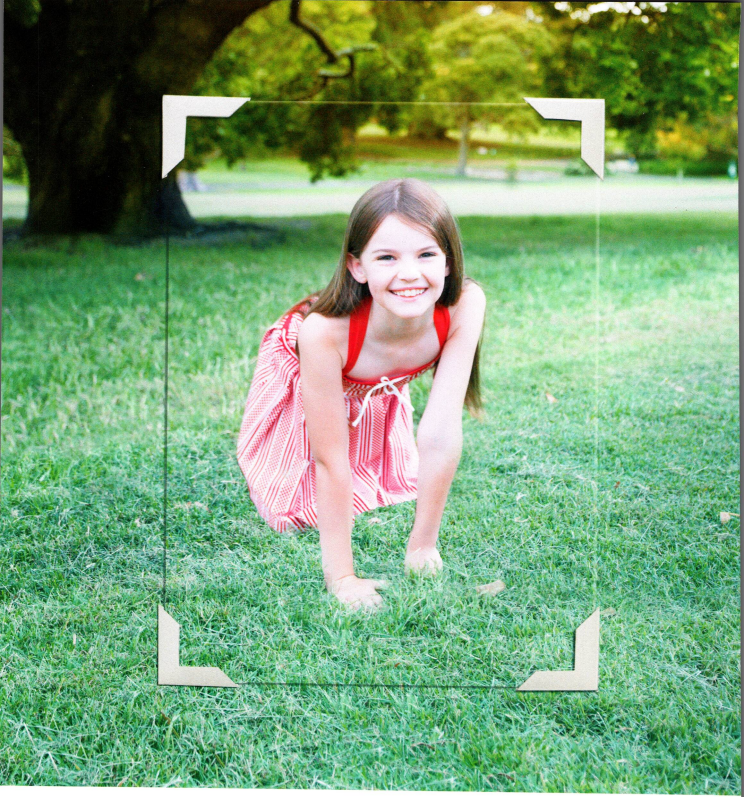

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